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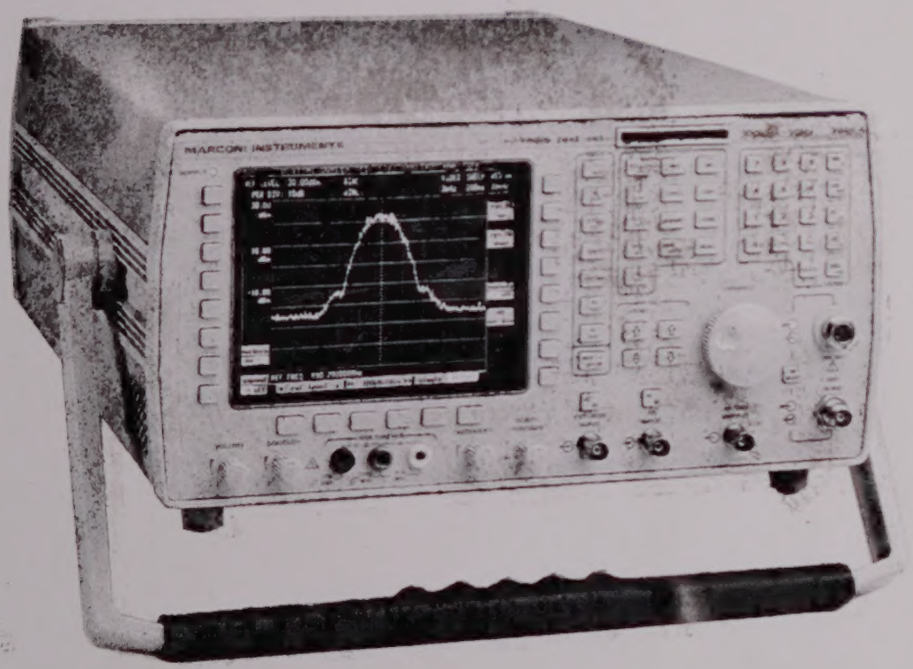
RADIO TEST SET

2965/65A/66A



Maintenance Manual

46662-1600

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MP MASTER
MA33578

Contains pages for the

Maintenance Manual

for

RADIO TEST SET

2965/65A/66A

Part number 46882-168D
Issue 3

Creation date 25-Sep-96

Please open and fit to the supplied Ring Binder

RADIO TEST SET
MAINTENANCE MANUAL
2965/65A/66A

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About this manual

This manual provides servicing information to component level for the 2965, 2965A, and 2966A Radio Test Sets.

Intended audience

The book is intended for qualified service engineers and assumes a knowledge of the test set to a level covered in the Operating Manual 46882-159J (2965) or 46882-274T (2965A, 2966A).

Structure

Chapter 1 Technical description

This includes block diagrams and detailed board circuit descriptions. The circuit descriptions refer directly to the servicing diagrams contained in Chapter 7.

Chapter 2 Maintenance

Refer to this chapter for board and unit access, service policy and routine safety testing and inspection.

Chapter 3 Adjustment and calibration

Refer to this chapter for information on user calibrations, software calibrations and hardware adjustments.

Chapter 4 Self-calibration information

Contains listings of the various self-calibration programs provided with the test set.

Chapter 5 Fault diagnosis

Contains a quick fault-finding guide and information about the HELP SET-UP diagnostics.

Chapter 6 Replaceable parts

Contains lists of board component parts and a section on miscellaneous mechanical parts.

Chapter 7 Servicing diagrams

Contains interconnection drawings, board circuits and board component layout drawings.

Associated publications

For an up-to-date list of associated publications, refer to the associated Operating Manual.

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Precautions

WARNING | CAUTION | Note

These terms have specific meanings in this manual:-

WARNING **Information to prevent personal injury.**

CAUTION **Information to prevent damage to the equipment.**

Note **Important general information.**

Hazard symbols

The meanings of hazard symbols appearing on the equipment are as follows:-

Symbol	Description
	Electrical, fire, tilting or input overload hazards
	Dangerous voltage
	Toxic hazard
	Hot surface
	Static-sensitive components

Safety

This product has been designed and tested in accordance with IEC1010-1 (BS EN61010-1) 'Safety requirements for electrical equipment for measurement, control and laboratory use.'

WARNING

Electrical hazards

AC supply voltage

This equipment conforms with IEC Safety Class 1, meaning that it is provided with a protective grounding lead. To maintain this protection, the supply lead must always be connected to the source of supply via a socket with a grounded contact.

Be aware that the supply filter contains capacitors that may remain charged after the equipment is disconnected from the supply. Although the stored energy is within the approved safety requirements, a slight shock may be felt if the plug pins are touched immediately after removal.

Fuses

Note that there are supply fuses in both the live and neutral wires of the supply lead. If only one of these fuses should rupture, certain parts of the equipment could remain at supply potential.

Removal of covers

Disconnect the supply before removing the covers so as to avoid the risk of exposing high voltage parts. If any internal adjustment or servicing has to be carried out with the supply on, it must only be performed by a skilled person who is aware of the hazard involved.

WARNING

Fire hazard

Make sure that only fuses of the correct rating and type are used for replacement.

If an integrally fused plug is used on the supply lead, ensure that the fuse rating is commensurate with the current requirements of this equipment.

WARNING

Cathode ray tube

Handling should only be carried out by experienced personnel.

High voltage

A high voltage charge may exist between the external conductive coating on the glass envelope and the final anode contact for some time after power has been removed. Contact with the very high voltages and low currents employed, whilst presenting a risk of ventricular fibrillation in some people, may also cause an involuntary reaction which could result in damage and hence implosion of the tube. Before handling the tube, the anode must be shorted to the external conductive coating via a 10 kΩ resistor to discharge the high voltage.

Implosion

This cathode ray tube (CRT) is a high-vacuum tube which has a high level of stored potential energy. To reduce the risk from an implosion, avoid stressing (particularly around the neck), surface abrasion, or scratching the tube, as such damage can result in serious weakening of the glass envelope, leading to explosive fragmentation of the glass. Personal protective equipment including eye protection must be worn when handling cathode ray tubes due to the risk of spontaneous or delayed implosion. Only approved shipping cartons should be used during storage or transportation. CRTs should not be handled by the neck.

Toxic materials

Cathode ray tubes may contain very small amounts of toxic materials. If a tube is broken, avoid inhaling, ingesting or contact with the dust. A defective tube should be disposed of in a safe manner by an authorized waste contractor.

WARNING

Toxic hazards

Some of the components used in this equipment may include resins and other materials which give off toxic fumes if incinerated. Take appropriate precautions, therefore, in the disposal of these items.

WARNING

Beryllia

Beryllia (beryllium oxide) is used in the construction of IC10 on the AF5 board.

This material, when in the form of fine dust or vapour and inhaled into the lungs, can cause a respiratory disease. In its solid form, as used here, it can be handled quite safely although it is prudent to avoid handling conditions which promote dust formation by surface abrasion.

Because of this hazard, you are advised to be very careful in removing and disposing of these components. Do not put them in the general industrial or domestic waste or despatch them by post. They should be separately and securely packed and clearly identified to show the nature of the hazard and then disposed of in a safe manner by an authorized toxic waste contractor.

WARNING

Lithium

A Lithium battery is used in this equipment (item 4, page 6-259). Internal Lithium batteries were also used by IC8, IC9, and IC44 on board A6 (now superseded by board A6/2).

As Lithium is a toxic substance, these batteries should in no circumstances be crushed, incinerated or disposed of in normal waste.

Do not attempt to recharge this type of battery. Do not short circuit or force discharge it, since this might cause the battery to vent, overheat or explode.

WARNING

Hot surfaces

Take care when touching the RF input N-type connector after the application of high levels of continuous power. If 50 W is exceeded for a prolonged period, the temperature of the connector can become excessive.

WARNING

Tilt facility

When the equipment is in the tilt position, it is advisable, for stability reasons, not to stack other equipments on top of it.

CAUTION

Static-sensitive components

The presence of static-sensitive components is indicated in the equipment by yellow disks, flags or labels bearing the symbol . Certain handling precautions should be observed to prevent these components being permanently damaged by static charges or fast surges:-

1. If a printed board containing static-sensitive components (as indicated by warning disk or flag) is removed, it must be temporarily stored in a conductive plastic bag.
2. If a static-sensitive component is to be removed or replaced, the following anti-static equipment should be used:-

- A **work bench** with a grounded conductive surface.
- **Metallic tools** grounded either permanently or by repeated discharges.
- A **low-voltage** grounded soldering iron.
- A **grounded wrist strap** and a conductive **grounded seat cover** for the operator whose outer clothing should not be of man-made fibre.

3. As a general precaution, avoid touching the leads of a static-sensitive component. When handling a new one, leave it in its conducting mount until it is required for use.
4. If using a freezer aerosol in fault finding, take care not to spray programmable ICs as this may affect their contents.

CAUTION

Input overload

On the RF N-type connector, the input power should not exceed 150 W.

On the RF TNC connector, the input power should not exceed 1 W.

Chapter 1
TECHNICAL DESCRIPTION

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Overall block diagrams

Block diagrams are provided in Fig. 1-1 (2965) and Figs. 1-2, 1-3 (2965A, 2966A) so that the individual board descriptions in this chapter can be related to the system architecture.

AR1, AR1/2 10 MHz OCXO board

Circuit diagrams: AR1 Fig. 7-11
AR1/2 Fig. 7-13

The following description applies to both the AR1 and AR1/2 boards. Where there are differences in component references, the AR1 references are shown in brackets.

The board provides the master 10 MHz reference frequency for the test set. The reference can be entirely internal or be locked to an external standard.

Under control of the A6 processor board, the OCXO board can do the following:

- Generate a 10 MHz reference signal to external equipment via the REF IN/OUT socket PLA.
- Phase lock its operation to a 1, 2, 5 or 10 MHz external reference on the same connector.

XL1 is an oven-controlled crystal oscillator (OCXO) which generates a 10 MHz TTL output. The output is buffered to provide the four outputs 10MHz A to D. The signal on pin 6 of IC10(c) (pin 8 of IC2(d)) is rectified by D7 (D6) to provide a monitor signal on pin 12 of IC5(d) (IC8(d)). This signal is compared with the reference voltage on pin 13 provided by a potential divider; the resultant INT OK output on pin 14 is used on the main processor board A6 to indicate operation of the OCXO.

Signal REFOUT from the A6 processor board is used to connect the OCXO output to the external equipment, or connect an incoming external reference frequency to a phase lock loop circuit. When the REFOUT signal is logic high, switch IC1(a) is set to connect PLA to the paralleled outputs of IC3(a) and (b). These buffer the output of the OCXO to enable the internal reference to drive a 50 Ω load. With REFOUT at logic low, the external reference on PLA is connected to buffer IC2(c).

The frequency of the OCXO can be adjusted over a small range by setting the voltage on the control input, pin 5. During the internal frequency standard mode of operation, the control voltage is provided by potentiometer R4 routed via switch IC1(b). R3 and diode D3 supply a stable reference voltage to R4. IC1(b) is controlled by the signal EXT REF from A6 processor board, which is low for internal reference operation.

When EXT REF is selected, the OCXO frequency is locked to the external reference by switching the control voltage line to the output of a sampling phase detector. The phase detector comprises sampler FET TR2, hold capacitor C11, buffer IC6(a) and the loop filter IC6(b) with associated components. The output of the loop filter is fed via D5, used to prevent negative voltages being applied to the OCXO, to the control voltage switch IC1(b). One input to the sampling FET TR2 is the OCXO signal, buffered by IC2(b) and divided by 10 by IC4(a). The resultant 1 MHz square wave is integrated by R12 and C10 to provide a triangular waveform. The second input to the sampler is the gate drive for the FET. This is derived from the external reference coming from switch IC1(a). The external reference is buffered by IC2(c) and divided by 10 in IC4(b). This divided signal is then used to drive monostable formed by IC5. R9 and C9 define the pulse width of the monostable. The narrow pulse from the output of IC5(d) drives the base of level shift transistor TR1 which then provides gate drive for the FET.

The divided external reference is detected by D4 to provide a voltage that is compared by IC8(a) to the 1.1 V reference voltage on pin 2. The output of IC8(a) comparator provides signal EXT PRES which is used by A6 processor to indicate presence of the external reference.

The internal tuning voltage from R4 is also fed to amplifiers IC6(c) and (d). The outputs from these ICs are two voltages that window the internal setting. When switched to external reference, these voltages are compared with the tuning voltage from the phase lock loop by IC8(b) and (c). The outputs of these provide signals EXT HI L and EXT LO L to A6 which indicate that the external reference signal is too high or too low in frequency.

AR2 PSU distribution board

Circuit diagram: Fig. 7-15

AR2 board provides distribution of all power supplies from the PSU to the various boards in the test set. All supplies to the RF tray have extra LC filters to reduce noise.

TR1 and TR2 form the front panel supply LED driver. The input is the 11 to 32 V input voltage from the DC-DC part of the PSU. TR1 with voltage reference D2 acts as a constant current source of around 20 mA to drive the LED. TR2 is used as a switch that turns off the LED when the DC input voltage is less than 10 V.

Power down of the PSU is monitored on A6 processor board via the POWDWN(L) signal.

In the event of an over-temperature condition being detected within the PSU, A6 is notified via the OVTEMP(L) signal.

The 125 kHz signal from A6 processor board is passed via this board to the PSU for synchronization.

A1, A1/2 Audio generator board

Circuit diagrams: A1 Fig. 7-18 to 7-25
A1/2 Fig. 7-28 to 7-35

Introduction

The main function of the A1 or A1/2 board is to provide a set of audio outputs at the AF GEN socket on the test set front panel, and a set of modulation outputs to the RF circuits. It also has a frequency measuring capability.

At the heart of the A1 board circuitry is a digital signal processor (DSP). This is configured to simultaneously synthesize three audio frequencies on the audio channel digital-to-analog converter (DAC) and three modulation frequencies on the modulation channel DAC. The frequency range of these signals is 1 Hz to 20 Hz in 0.1 Hz steps. The DSP is also configured to provide sinewaves at frequencies up to 100 kHz via a function generator channel. An AF SYNC line serves as a single bidirectional control line between this DSP and that on the A5 display board.

Overall control of the DSP and of switching, etc., is achieved by means of a microcontroller (µC). Communication between µC and DSP is via a bridge circuit. The µC acts as a command decoder and overall AF synthesizer organiser. It receives high level commands from the CPU on the A6 board via the I^2C interface and executes them by configuring the DSP, signal routeing and attenuator settings. The µC also controls a frequency counter and sends results back to the A6 board via the I^2C interface.

Microcontroller, memory and addressing (sheet 1)

The bidirectional I^2C data and clock lines to µC IC3 are on PLA 12/14. Data buffer IC7 strobes the µC data lines D0-D7 from the address/data bus AD0-AD7. Address latch IC8 latches the low order address lines from the address/data bus and IC9(a), IC9(b) buffer the high order address lines.

IC10 is an EPROM (Erasable Programmable Read-Only Memory) which holds the program code for the µC. It also contains the boot code for the DSP. Selection of IC10 is by BMS(L) when booting the DSP and µC line PSEN when accessed by the µC in normal operation.

A 32K × 8-bit RAM, IC11, is used for temporary data storage, reading of the RAM being accomplished using A15 for chip select and the µC read signal, RDUC(L), gated with reset hold, RST_HOLD. Writes also use A15, together with write access using the µC write signal WR_UC(L).

Address decoders IC12 and IC13 provide clocks or select lines for the routeing switch latches, SWADDn, the audio counter, ACADDn, the modulation scaling DAC, DACADDn, the µC side of the µC to DSP bridge, BSUC(L), and an interrupt request line, INT2, to the DSP.The µC has three external interrupt sources: I^2C, audio counter interrupt ACSTAT and INT from the DSP. D-type flip-flop IC1 converts the narrow pulse of the interrupt to a steady state, ensuring its visibility to the µC.

Bridge (sheet 2)

The µC sends data to the DSP by writing data on D0 to D7 to IC17 and reads data from the DSP via IC18. Similarly, when the DSP reads the bridge, it enables the output of IC17 and writes to the bridge by latching data into IC18 via DSP data bus lines DD0 to DD7.

The bridge is defined as an external data location in the DSP software and is connected to D8 to D15 of the multiplexed data and program memory data bus of the DSP. All DSP data reads on the A1 board are confined to eight bits via DD0 to DD7. For speed, the top eight bits of the DSP's 16-bit external data bus are forced low when data is read by the DSP, this being implemented by the read strobe RDDSP(L) enabling the outputs of IC19 on to DD8 to DD15.

Handshaking between DSP and µC is done with four bridge status flags, TXRDY2, RXRDY1, TXRDY1 and RXRDY2.

RXRDY2 indicates to the µC if there is information on the bridge for it to read. When the µC reads the bridge, it is reset.

TXRDY1 is used by the µC to determine if the DSP has read the data which it had previously sent to the bridge, thus enabling it to send another byte. It is set when the DSP reads the bridge.

Flags RXRDY1 and TXRDY2 serve the same purpose for the DSP when reading and writing to the bridge.

The DSP reads bridge flag status by examining the contents of its bridge status buffer IC20. The µC checks bridge flag status via port 1 (see sheet 1).

Digital signal processor (sheet 3)

DSP IC30 is the waveform and signalling generator processor. On board reset it boots up with a monitor program which it retains while the board is powered up, further functions being loaded via the bridge. Two serial signals are produced on its serial output DT1. Digital filter IC39 works in conjunction with IC37 left/right strobe to provide selection and conditioning of audio signals DL and DR to the dual serial DAC IC47 (sheet 4) which drives the audio and modulation channels (generators 0-3).

The DSP also communicates with parallel DAC IC40 (sheet 4), used for the function generator channel (generator 4), by writing data to latches IC34 and IC35, data being latched into the ICs using the select line from IC32 and DSP write line WRDSP(L).

The clock generator IC26(a) divides the 20 MHz system clock on PLB pin 3 down to 10 MHz to provide the processor clocks for the DSP, µC and audio counter. The second clock generator, IC38(a), IC38(b) and IC26(b), divide the 20 MHz by 6 to provide a 1.667 MHz clock for digital filter IC39.

PLB pin 5 carries the AF SYNC line between the DSPs on A1 and A5 boards. Both processors can read the line or pull it low. This line is generally used during SYSTEMS testing.

DACs and filters (sheet 4)

There are two reconstruction DACs shown on this sheet of the circuit. IC47 is a dual serial DAC driven by IC39 (sheet 3) outputs DL and DR. Bit data on DL and DR is clocked into IC47 with the CLK signal and latched with WS. The two outputs of IC47 feed the audio and modulation channels via similar Sallen and Key implementations of Butterworth 2nd order 20 kHz low-pass filters IC48, IC49 and associated components. These filters smooth the fast transistions of the DAC, ensuring that no energy is seen outside the required DC to 20 kHz range. The maximum output level of both filters is 3 V peak.

Parallel DAC IC40 supplies the function generator channel. IC41 and IC42 act as a 4th order Sallen and Key 100 kHz low-pass filter. Data for the DAC comes from the DSP via latches IC34 and IC35 (sheet 3).

Voltage reference IC43 and buffer IC44 provide a low drift and level accurate +5 V voltage reference VREF for use by IC40 and the AM and RF level circuit on sheet 6.

Audio out path (sheet 5)

Audio generator and function generator signals are selected by IC50(a)/(e), level controlled and buffered to provide the audio out signal to the AF GEN terminal on the front panel.

The output level control is selected by IC52 which selects the appropriate tap on the potential divider R33 to R38. IC52 is controlled from data bus D0 to D7 bus via IC73 (sheet 7) latched by the active low SWADD3 control signal. Attenuation factors are 1, 5, 50, 500 and 5000.

Output buffer circuits comprise a unity gain buffer IC74(a)/IC53 together with output protection circuits. The configuration can drive a 5 V RMS signal into a 50 Ω load at 100 kHz. IC53 is a buffer capable of driving over 90 mA in either direction. This is placed within a closed loop circuit with unity gain, the other components being the output protection circuit and operational amplifier IC74(a) C33 and the combination of R47, R48 and C16 provide compensation for driving capacitive loads.

Output protection is based around two MOSFETs TR2 and TR4, used for their low ON resistance, and is designed to protect the audio output for peak levels of ±10 V or greater up to a maximum of 50 V. A positive peak detector is used to switch TR4 off and a negative peak detector to switch TR2 off. Zener diodes D11 and D12 clamp the maximum voltage at pin 8 of IC74(a) to ±10 V.

Modulation and calibration paths (sheet 6)

The AM path consists of switch IC54/55 followed by half of dual DAC IC57. The AM drive to the RF tray is made up of two signals, AMREF taken from the output of the switch and AM&RFLEV taken from the DAC output.

When AM is turned off and the RF power level is above +7 dBm (on TNC port only), the +5 V reference VREF is fed into summing amplifier IC56(a) via resistor R55. Below +7 dBm, the path through R56 is used. The resultant output from IC56(a) is inverted by IC56(b) and fed to the first levelling loop on AF5 via PLE pin 5. IC56(a) output is also fed to half 'B' of dual 12-bit DAC IC57, whose current output is converted to a voltage by IC58(b). The output from IC58(b) becomes the AM&RFLEV signal, which is fed to the second levelling loop on AF5. By changing the DAC setting this levelling loop controls the RF power level from the test set. IC57 is controlled by the µC using select line DACADD3, address lines A0 to A1 which select which input register is to be accessed, write line WRUC(L) and DACADD2 which is used to load the DAC registers from the input registers.

For the situation where AM is on, the MOD_GEN or FUNC_GEN signals are routed through switch IC54/55 to the summing amplifier and are superimposed on the reference signal. In this case the reference is only fed via R56 and the maximum RF power limited to +7 dBm. The modulation depth is set by the signal level from the generator in use. As the RF power level is changed with DAC IC57, the modulation on the AM&RFLEV signal is kept at the same relative proportion to the DC level.

Frequency and phase modulation is generated by IC61 to IC63 and output to AF2 via PLE pin 7. Selection of the modulation source is by switch IC61 and summing amplifier IC62(a). For FM the resultant modulation signal on TP9 is switched via IC63 pins 14 and 15 to R75 and inverted by IC62(b). In the case of PM the signal is passed via IC63 pins 2 and 3 to a differentiator formed by IC62(b) and passive components R74, C50 and R76. When FM and PM are turned off the input to IC62(b) is grounded via pins 10 and 11. The output of IC62(b) is the FM&PM signal fed to AF2. Scaling of the FM or PM modulation is by varying the output level from the modulation generator in use and scaling DACs on AF2.

Where external modulation is required, the signal from the A2 board is applied to the second half of DAC IC57 via PLD pin 5. The DAC then scales the external modulation signal to obtain the desired modulation level for the particular modulation type chosen. The output of the DAC is fed to the modulation source switches ICs 54, 55 and 61.

Analog 8 to 1 multiplexer IC59 selects the source for the AFREF signal on PLE pin 5 under control of the DC4 to DC7 bus from IC73 latched by the SWADD3 control signal. The AFREF signal is fed to audio processor board A2 for use during automatic calibration.

Control of selection switches ICs 54, 55, 61 and 63 is by control lines SW0 to SWC12, which are generated on sheet 7; a particular switch element is selected by setting the control line low.

Audio counter and switch control (sheet 7)

PAL IC66, which contains audio counter control logic, and programmable interval timer IC67, together with D-type IC65 form the audio counter. It is sourced from the A2 board and produces a frequency count output to the µC on the data bus.

The audio counter consists of three blocks; an 82C54 triple counter, a state machine and interface logic. It is designed to measure the TTL signal from A2 on PLF over the frequency range 0.1 Hz to 500 kHz. The accuracy of the counter depends on the measurement time which is controlled by software on the µC.

The state machine incorporated in PAL IC66 effectively controls two counters. Counter 0/1 is configured as a 32-bit counter assigned to counting the 5 MHz reference frequency from IC65(b). Counter 2 counts the number of AF cycles over which the measurement is taken. Using the results in these counters the input frequency is calculated by the µC. IC67 contains the three counters.

The SWADD1 and SWADD2 control signals from sheet 1, via inverters IC69 and IC70, latch the D0 to D7 bus to generate the switch control signals SWCn. SWC0 to SWC5 select the DSP generated signal source for the amplitude modulation (sheet 6). SWC6 to SWC9 select the DSP generated signal source for the frequency and phase modulation (sheet 6). SWC10 to SWC12 configure IC62(b) (sheet 6) for FM, PM or no modulation.

The SWADD3 control signal latches the D0 to D7 bus to provide the DC0 to DC7 bus. Bits DC0 to DC3 set the AUDIO OUT attenuator (sheet 5), while bits DC4 to DC7 select the appropriate source for the AFREF signal (sheet 6).

Reset sequence and booting of DSP (sheets 1 to 3)

The system reset signal SYSRES(L) on PLA pin 16 is used to reset the two processors on A1. This line is driven low during power up, and at any other time when a reset is called, by the processor on A6 board. When SYSRES(L) is low both the µC and the DSP are held in reset and D-type flip-flop IC1(a) is preset. The Q and not Q outputs of IC1(a) generate the reset hold signals RST_HOLD and RT_HOLD(L) respectively, RST_HOLD being used to hold the µC in reset.

On SYSRES(L) going high the DSP is allowed to run initially loading its boot code from EPROM IC10. During this time the RT_HOLD(L) signal enables buffers IC23 and IC24 placing the DSP addressing data on to the µC address bus and therefore IC10 EPROM. The data is read from the EPROM, enabled by the DSP signal BMS(L), to the DSP via the bridge data latch IC17. The latch section of IC17 is held in a transparent state by the RST_HOLD signal via OR gate IC15(c) and its output enable on pin 1 is driven from the DSP read signal RDDSP(L) via OR gate IC21(a).

When the DSP has finished loading the boot code it will start to run the boot program. The boot program writes to the µC reset address which uses select line RSTADD. The combination of the active low RSTADD and DSP write line WRDSP(L), gated together with IC2(a), resets flip-flop IC1(a), releasing the DSP boot state. The µC then begins to run its own code.

A2, A2/2 Audio processor board

Circuit diagrams: A2 Fig. 7-37 to 7-41
A2/2 Fig. 7-43 to 7-47

Scope vertical shift (sheet 1)

The A channel signal SC A on PLA pin 3 comes from either the demodulated AM or FM signals or the AF input via analog processing circuits on the A3 board. IC1(a) inverts the signal. IC1(b) sums this signal with a +5 V reference and a software controlled level from DAC IC2(a). The latter is controlled by the microprocessor on the A6 board via the A2 board I^2C bus interface circuits on sheet 5. The DAC is set to a value derived from the position of the front panel SCOPE VERTICAL SHIFT control. IC1(b) output is the CH A signal fed to the A5 display board.

SC B, the B channel input, comes from the front panel EXT MOD input via the external modulation circuits on the A3 audio processor board. Summing circuits and their inputs are similar to those of channel A, the output of IC9(b) being the CH B signal to the A5 board.

FFT audio source (sheet 1)

Input SC A is also used to derive the FFT AUDIO signal to A5. IC5(b) is used to buffer and scale the SC A signal to provide the FFT AUDIO signal to the DSP input selector on the A5 board.

Zero crossing detector (sheet 1)

Switch IC4 selects either SC A or SC B according to the state of SCTRIG A which is one of the I^2C controlled signals on control bus 1. The zero crossing circuit ensures that the EXT TRIG signal for the display always occurs at the same phase reference point.

IC5(a) provides a buffered signal to limiter R13 and dual diode D1. The limited signal is then passed through amplifier IC6 to the comparator IC7 providing a logic level output which switches at each zero crossing transition. Inverter IC8(a) buffers the signal before it is fed to A5 display board as EXT TRIG.

Reference generator (sheet 1)

This circuit generates a programmable calibration signal CAL from multiplexer IC14 for use on the A2 and A3 boards. The CAL signal source is selected, under I^2C control, from either AF REF, –5 V REF, +1 V REF, +5 V REF or SQUELCH.

AF REF is derived from the A1 audio generator board and can be audio signals or DC levels. The –5 V REF is the master voltage reference generated by the highly accurate positive voltage reference IC10 and amplifier IC11 configured to provide a negative voltage output. The negative reference from IC11 is then buffered by IC12 before use.

The other two fixed references, +1 V REF and +5 V REF, are derived from the –5 V REF. Inverting amplifier IC13, with a gain of –0.2, generates the +1 V REF while the second inverting amplifier IC15, with a gain of –1, generates the +5 V REF. The SQUELCH signal comes from the squelch control circuit, derived in turn from the AGC voltage generated on the demodulation board AE7.

The reference 4 V REF for the digital oscilloscope ADC on A5 is also derived from the –5 V REF. The –5 V REF is first scaled by DAC IC20(a) before being summed with itself in IC21(b). The output from IC21(b) includes an emitter follower TR1 to provide the greater current capability required by the ADC on A5. Therefore, under I^2C control of IC20(a), the oscilloscope ADC reference may be altered between approximately 3.5 V and 4.5 V, enabling the oscilloscope scaling to be adjusted easily.

External modulation scaling (sheet 1)

SC B signal is the source for the EXT MOD signal used as a voltage reference to the parallel DAC on the A1 board used for external modulation scaling (see A1 board description). The EXT MOD signal may be used to generate the AM, FM and PM modulation in the signal generator. The SC B signal is scaled by potential divider R37 to R39, the scaling being selected by IC17 when the appropriate control signal is made active low under software control. IC18(a) amplifies the resultant signal by approximately 16 times to give gains between 7.8 and 16. Unity gain IC18 inverts the signal to IC19. Under software control, switch IC19 selects either an inverted or non-inverted EXT MOD signal.

Output buffers (sheet 2)

The input signals AF and DEMOD both come from filter circuits on the A3 board (sheets 3 and 4 respectively). The AF signal is buffered by IC30 to provide the AF OUT signal to the rear panel. The rear panel DEMOD output is buffered by IC31(b), software selecting, by switch IC32, either the non-inverted direct signal or the inverted signal from IC31(a).

Peak detector and RMS-DC signal selection (sheet 2)

Signals AF and DEMOD, together with CAL and EXT MOD from sheet 1 form the inputs to software controlled switches IC22 and IC23. IC23 selects one of these inputs and applies it to the peak detector circuit, described later.

IC22 selects the input required for the RMS-DC converter or that required to be applied directly to the ADC during calibration.

RMS-DC converter and low-pass filters (sheet 2)

The input to IC27, the RMS-DC converter, is fed from switch IC22 via a frequency response correction circuit comprising IC26, R53, C13 and C45. These provide a slowly increasing gain with frequency to compensate for losses in the RMS-DC converter.

The output from the RMS-DC converter is passed through a 20 Hz low-pass filter for further processing by the ADC.

A to D conversion (sheet 2)

IC36 selects the input signal to the ADC under software control.

The six inputs to IC36 are:-

- RMS-DC converter input
- RMS-DC converter output, filtered
- RMS-DC converter output, unfiltered
- 10 Hz filter output
- CAL (calibration signal)
- Analog ground

IC37 buffers the signal from the switch as well as offsetting it so that the bipolar input becomes unipolar as required by the ADC IC38. The digital output from the ADC can be read by the processor on A6 via the I^2C interface circuits on sheet 5.

Squelch control (sheet 3)

The squelch control circuit allows the loudspeaker output to be muted when there is not enough RF power available at the receiver. The AGC line from AE7, which is at around +10 V for no signal and becomes closer to zero as power increases, is first attenuated by R96/R97 before being compared with a programmable reference in IC39(b). The reference generated by DAC IC54 may be set under processor control via the I^2C interface. R95 converts the current output of the DAC to a voltage.

The comparator switches FET TR2 on when its output is positive and off when negative. TR2 acts as a switch which changes the attenuation provided in the loudspeaker amplifier chain by R69/R72 from around 23 dB to greater than 60 dB when TR2 is turned on. Thus when the receiver input is above the threshold set by the DAC the loudspeaker is enabled.

Loudspeaker and audio count signal selection (sheet 3)

Software controlled switches IC24 and IC25 select one of signals AF, DEMOD, CAL or EXTMOD according to the codes on the SPK n and CNT n lines as set by A6 processor via I^2C. IC24 and IC25 outputs are then fed to the loudspeaker and audio count paths respectively.

Volume control and loudspeaker amplifier (sheet 3)

The audio output from selector switch IC24 is used as the reference on multiplying DAC IC20(b). The output from current to voltage converter IC39(a) is then a voltage that is proportional to the DAC reference input. This provides a volume control for the loudspeaker that may be set under software control.

After passing through the attenuator formed by R69 etc. (see above, under squelch control), the signal is amplified by IC40, which provides enough power to drive a loudspeaker. As IC40 only uses the positive 12 V supply, the signal input is biased to around +6 V by R70 and R71.

Zero crossing detector (sheet 3)

The audio signal selected for counting is fed through the zero crossing detector formed by IC41 to IC8(b) before being passed as a logic level signal to audio generator board A1 where the counter circuit is located. This zero crossing detector works in exactly the same way as that used for the scope trigger on sheet 1.

Peak detector (sheet 4)

The PK_SIG signal from the signal selection circuit (sheet 2) is buffered by unity gain amplifier IC56 before passing to IC57 which may be configured to be inverting or non-inverting with a gain of 1. Switch IC59 provides the required switching under software control.

Positive peak detection of the signal on IC57 output is accomplished using the tracking ADC formed by comparator IC58, control circuit IC49(b)/IC60, counters IC61 to IC63 and DAC IC64. The resulting 12-bit digital peak value is available on control bus 2 when read from data buffers IC65 and IC66 under the control of the PK_RD_L signal. When the current generated through R123 by the input signal is equal but of opposite polarity to that supplied by DAC IC64, the comparator output line CNT_EN_L is logic low, which tells the control circuit to clock the counters. The 12-bit code from the counters is used to set the DAC so that its output will climb to match that through R123 when the comparator output will change and counting stops. Thus for slow moving inputs the peak detector will follow the input signal but for higher frequency inputs the counters will be clocked for short periods at the peaks of the signal until the true peak value has been obtained.

I²C interface (sheet 5)

The A6 CPU board reads/writes to this board via the I²C bus. I²C bus data is interfaced to the board control buses and decoders by IC44 to IC48. IC49(a), IC50 and IC51 are 2-to-4-bit decoders which decode the data into EMOD*n* (external modulation scaling), RMS*n* (RMS measurement input), PEAK*n* (peak measurement input), SPK*n* (loudspeaker input) and CNT*n* (count input) control signals. IC67 provides write enables for DACs IC2, IC20 and IC54 (via data latch IC55). The exact functions of all of these control signals are detailed below.

External modulation gain

Control Line (active low)	Gain Setting
EMOD_0	16.133
EMOD_1	12.758
EMOD_	10.164
EMOD_3	7.813

RMS-DC input selection

Control Line (active low)	Input Selected
RMS_0	AF
RMS_1	DEMOD
RMS_2	CAL
RMS_3	EXTMOD

Peak detector input selection

Control Line (active low)	Input Selected
PEAK_0	AF
PEAK_1	DEMOD
PEAK_2	CAL
PEAK_3	EXTMOD

Loudspeaker input selection

Control Line (active low)	Input Selected
SPK_0	AF
SPK_1	DEMOD
SPK_2	CAL
SPK_3	EXTMOD

Audio counter input selection

Control Line (active low)	Input Selected
CNT_0	AF
CNT_1	DEMOD
CNT_2	CAL
CNT_3	EXTMOD

IC46 outputs

Control Line	Function
PKDETINV	Inverts peak detector input signal when high
DEMINV_L	Inverts DEMOD OUT signal when low
A/D_0	Selects ADC input signal (see below)
A/D_1	Selects ADC input signal (see below)
A/D_2	Selects ADC input signal (see below)
SQ_ON	Squelch status read - high when squelched
ADD_EN_L	IC67 address decoder enabled when low
B/A_L	Selects A or B parts of DAC's IC2 and IC20 (A when low)

ADC input selection

A/D_2	A/D_1	A/D_0	Input Selected
Low	Low	Low	RMS-DC input
Low	Low	High	Filtered RMS-DC output
Low	High	Low	Un-filtered RMS-DC output
Low	High	High	Filtered RMS-DC input
High	Low	Low	Ground
High	Low	High	Ground
High	High	Low	CAL
High	High	High	Ground

The data bus consists of lines D0 through D11 together with BUSY_L. The lower eight bits are used for both reads of the ADC value and peak detector together with writes to dual DAC's IC2/IC20 and latch IC55. D8 to D11 are only used for reads of the ADC and peak detector whilst BUSY_L monitors the state of the ADC.

The address decoding for the programmable DAC's, peak detector control, and ADC reads is performed by a 3-to-8-bit decoder IC67 which takes its inputs, A0-A2, from IC48 together with enable line ADD_EN_L from IC46. Outputs are active low.

Address decoding

A2	A1	A0	Signal	Function
Low	Low	Low	VSHIFT_L	Vertical shift DAC IC2 write enable.
Low	Low	High	AD_RD_L	ADC read enable and trigger.
Low	High	Low	REFVOL_L	Scope ref. and volume DAC IC20 write enable.
Low	High	High	PK_RES_L	Peak detector reset.
High	Low	Low	PK_RD_L	Peak detector read enable.
High	Low	High	SQU_L	Squelch DAC latch IC55 write enable.
High	High	Low		Not used.
High	High	High		Not used.

Supply regulators (sheet 5)

Positive and negative regulators, IC52 and IC53 respectively, provide clean 5 V supplies to both A2 and A3 audio processor boards.

A3 Audio processor board

Circuit diagrams: Fig. 7-50 to 7-56

AF input and scope gain (sheet 1)

This is the high impedance input for the front panel AF INPUT socket. AC or DC input coupling is selected by IC7, controlled by AF_DC_L. 600 Ω input load impedance R200-203 is selected by RLB, controlled by AF600R_L.

RLE, controlled by AF_MEASURE_L, allows the following circuitry to be connected to either the AF input or to the calibration signal CAL. Relay RLA, control line AF_IP, then passes the CAL or AF_IN signal to either the 0.9 dB or –40.9 dB input attenuators. The two attenuators are formed by R30/R31 and R32/R33 together with their associated compensation capacitors. (R30/R31 = -0.9 dB)

MOSFET's TR1 and TR2 select the outputs of the two attenuators to feed the scaled input signal to the input buffer/amplifier IC8. The transistors are controlled by AFATT0 and AFATT0_L respectively. IC8 has a gain of 2.77 and can have its output offset controlled via the gain set resistors by 12-bit DAC IC9. See the information on input offset compensation DACs for sheet 6 with regard to I^2C control of this DAC.

The output from IC8 feeds the AF input selector (see below) and the AF scope gain input attenuator. The AF scope gain is set by two ×10 amplifiers, IC11/IC13, and two attenuators whose value is set by switches IC10 and IC12. Gains selectable by control lines AF_SCGN0-2 are ×100, ×40, ×20, ×10, ×4, ×2 and ×1.

AF input selector and path gain (sheet 1)

Under software control, IC1 (sheet 1) selects the AF input from one of the following:-

- RECONST AF from the reconstruction filter circuit on the A5 display board.
- AS F PWR, the forward power reading signal from the rear panel ACCESSORY socket.
- AS R PWR, the reverse power reading signal from the rear panel ACCESSORY socket.
- MM, the multimeter signal from the A7 front panel interface board.
- CAL from the A2 board.
- A signal derived from the AF INPUT circuits (see next section).

After buffering by unity gain amplifier IC2, the selected signal is amplified by IC4 and IC6. The overall gain is set to ×1, ×10 or ×100 by switches IC3 and IC5. Each amplifier has a gain of 10 while the switches set the overall gain by selecting the appropriate outputs from attenuators R15-R17 and R21-R23. The output from IC6 provides the AFFILTIN signal to the AF filter circuits on sheet 3.

Demodulation input selector (sheet 2)

The DEMOD AM and DEMOD FM input signals are from the AE7 board. The FM signal is buffered by the unity gain amplifier IC14(a), and splits to provide FM, and PM via the PM integrator circuit IC14(b).

Under software control, switch IC15 selects either AM, FM PM or CAL. The unity gain amplifier IC16 buffers the signal to provide the DMFILTIN signal to the demodulation programmable gain and filter circuits (sheet 4).

External modulation input and gain circuits (sheet 2)

The external modulation input circuit works in exactly the same way as the AF input on sheet 1 (see above). In this case, the component functions are as follows:-

- AC/DC input switching, IC17, controlled by EM_DC_L.
- 600 Ω input load, R204-207, switched by RLD, controlled by EM600R_L.
- 0.9/40.9 dB attenuator input switching, RLC and RLF, controlled by EM_IP and EM_MEASURE_L respectively.
- 0.9/40.9 dB input attenuators, R65/66 and R67/68 respectively.
- Input attenuator selection, TR3 and TR4, controlled by EMATT0 and EMATT0_L.
- Buffer/amplifier, IC18.
- Offset correction DAC, IC19.

The external modulation gain is set by two ×10 amplifiers, IC22/IC24, and two attenuators whose value is set by switches IC21 and IC23. Gains selectable by control lines EM_GN0-2 are ×100, ×40, ×20, ×10, ×4, ×2 and ×1.

The output from IC24 provides the SC_B_OUT signal to A2 audio processor board.

AF filters (sheet 3)

Switch IC27 together with the ÷3 attenuator R92/93 provides the final gain setting stage for the AF signal.

The rest of sheet 3 shows all front panel selectable audio filters. The functions of each device are explained and then the routeing through the filter stages detailed for each filter type.

- IC25, ×2.828 amplifier used when no filtering required.
- IC28, SC11310, programmable gain/loss IC used to compensate for gain errors in the filters.
- IC29, MAX270, programmable dual continuous low-pass filter used for all low-pass filters and anti-alias input filter for switch-capacitor blocks.
- IC26, ×2 amplifier.
- IC30, MAX260, programmable dual switched-capacitor filter used for psophometric filters.
- IC32, MAX260, programmable dual switched capacitor filter used for band-pass, 300 Hz low-pass, and psophometric filters.
- IC35, ×1.3 or ×–3.01 amplifier dependent on configuration.
- IC36, MAX270, programmable dual continuous low-pass filter used for post filtering of switch-capacitor blocks.
- IC38, ×2.828 amplifier with offset adjustable by dual 8-bit DAC IC39. Feeds AF signal to A2 audio processor board.

The clocks for the switched-capacitor filters, AFCLK1-3, are generated by IC76 on sheet 6.

The following table details the paths through switches IC31, IC33, IC34 and IC37 together with the gain/loss setting of IC28 for each front panel filter selection.

Filter	IC28	IC31	IC33	IC34	IC37
None	–25.0 dB	Not used	Not used	Not used	pins 2 to 3
20 kHz LP	9.1 dB	Not used	Not used	Not used	pins 15 to 14
300Hz LP	1.0 dB	pins 10 to 11	pins 10 to 11	pins 10 to 11	pins 10 to 11
Bandpass	–1.5 dB	pins 7 to 6	pins 10 to 11	pins 7 to 6	pins 10 to 11
CCITT	20.1 dB	pins 15 to 14	pins 15 to 14	pins 15 to 14	pins 10 to 11
C-MESS	18.3 dB	pins 15 to 14	pins 15 to 14	pins 15 to 14	pins 10 to 11
2 kHz LP	9.1 dB	Not used	Not used	Not used	pins 15 to 14

Note: The 2 kHz low-pass filter is used only during multimeter operation.

Control of the filter integrated circuits is shown later in the sections on I^2C control.

Demodulation filters (sheet 4)

IC42 provides switching of the ×1 or ×0.5 attenuation from the potential divider R120/R121. IC43 is a programmable gain/loss circuit providing ±25.5 dB gain/loss in 0.1 dB steps. These two gain control elements, together with the FM gain setting on AE7 provide all of the range selection for demodulation measurements as well as correcting the gain through the filters.

The rest of sheet 4 shows the front panel selectable demodulation filters. The functions of each device will be explained and then the routeing through the filter stages detailed for each filter type.

- IC44, MAX270, programmable dual continuous low-pass filter used for all lowpass filters and anti-alias input filter for switch-capacitor blocks.
- IC41, ×2 amplifier.
- IC45, MAX260, programmable dual switched-capacitor filter used for psophometric filters.
- IC47, MAX260, programmable dual switched capacitor filter used for band-pass, 300 Hz low-pass, and psophometric filters.
- IC50, ×1.3 or ×–2.488 amplifier dependent on configuration.
- IC51, MAX270, programmable dual continuous low-pass filter used for post filtering of switch-capacitor blocks.

The clocks for the switched-capacitor filters, DMCLK1-3, are generated by IC77 on sheet 6.

IC53 is a ×2 amplifier with offset adjustable by dual 8-bit DAC IC54. It feeds the DEMOD signal to the scope attenuator and A2 audio processor board.

The following table details the paths through switches IC46, IC48, IC49 and IC52, together with the gain/loss setting of IC43 for each front panel filter selection when using the 100 kHz FM range.

Filter	IC43	IC46	IC48	IC49	IC52
None	–9.0 dB	Not used	Not used	Not used	pins 2 to 3
20 kHz LP	–9.0 dB	Not used	Not used	Not used	pins 15 to 14
300Hz LP	–17.0 dB	pins 10 to 11	pins 10 to 11	pins 10 to 11	pins 10 to 11
Bandpass	–17.8 dB	pins 7 to 6	pins 10 to 11	pins 7 to 6	pins 10 to 11
CCITT	2.0 dB	pins 15 to 14	pins 15 to 14	pins 15 to 14	pins 10 to 11
C-MESS	0.9 dB	pins 15 to 14	pins 15 to 14	pins 15 to 14	pins 10 to 11
5 kHz LP	–9.0 dB	Not used	Not used	Not used	pins 15 to 14

Control of the filter integrated circuits is shown later in the sections on I^2C control.

Demod scope attenuator (sheet 4)

The demod scope attenuator circuit takes the output from the filters and scales it as required for the demodulation analyzer and oscilloscope. IC56 switch selects the required output from the attenuator chain and feeds it to ×2.5 amplifier IC57. Overall gains of the demod scope attenuator that may be set by control lines DM_SCGN0-3 are ×2.5, ×1.5, ×1.25 or ×0.75. The SC_A_OUT signal to audio processor board A2 is then selected from either the output of IC57 or the AF_SCOPE signal from sheet 1.

I^2C control circuits (sheet 5)

Expander chips IC59 and IC61 to IC63 decode the I^2C bus inputs from the A6 board CPU. IC59 provides discrete control signals (unbuffered and buffered) and also the inputs to relay drivers TR5 to TR7. IC61 and buffer IC78 provide data bus outputs D0-7 to sheet 6 circuits.

IC62 provides the LATCHSEL signals to the data latches on sheet 6, and two relay current drives AF and EM_MEASURE to input switching relays on sheets 1 and 2 respectively.

The low order bits from IC63 provide write select signals to the filter programming and offset compensation circuits on sheet 6, via chip select decoder IC75. High order bits provide three additional discrete control signals.

Counter IC65 produces a 1 MHz signal to the A2 board, derived from the 10MHz D reference clock signal from AR1. A buffered version of the 10 MHz D reference, from IC65 input, is used by the programmable filter clocks circuit on sheet 6.

The functions of the outputs of the I^2C interface ICs are as follows. Note that the control line status is after the buffering.

IC59 generated control lines

Control Line	Function
AF_DC_L	Sets AF input to DC coupled when low
EM_DC_L	Sets external modulation input to DC coupled when low
AF600R_L	Selects 600 Ω load on AF input when low
EM600R_L	Selects 600 Ω load on external modulation input when low
AF_IP	Switches AF input to –40.9 dB attenuator when high
EM_IP	Switches external modulation input to –40.9 dB attenuator when high
AFATT0	Uses output of –0.9 dB. AF attenuator used when +ve
AFATT0_L	Uses output of –40.9 dB. AF attenuator used when +ve
EMATT0	Uses output of –0.9 dB. External modulation attenuator used when +ve
EMATT0_L	Uses output of –40.9 dB. External modulation attenuator used when +ve

IC62 generated control lines

Control Line	Function
A0, A1	Address lines used on sheet 6
CSA to CSD	LATCHSEL latch enable lines to sheet 6 (data latched on ↓ edge)
AF_MEASURE_L	AF input set to front panel when low
EM_MEASURE_L	External modulation input set to front panel when low

IC53 generated control lines

Control Line	Function
C0 to C4	WR_SEL bus used to drive write select decoder IC75
SYN_CLKS	Pulsed low to synchronize filter clock generators IC76/77
DMFILGN0	Sets demod prog gain input to 0.5 when high
DM_SCGN4	Selects demod output for SC_A output when high

I²C control circuits (sheet 6)

Information on the data bus D0-7 is latched under the control of CSA to CSD chip select signals into data latches IC66, IC67, IC69, and IC72 respectively. Depending on the type of device being driven by these latched outputs, some extra decoding is provided by 2 to 4 line decoders IC68, IC70, IC71, IC73 and IC74. These decoded lines provide the control signals for the path selection and gain switches on sheets 1 to 4.

Input/output offset compensation is provided by DACs IC9/IC19, for input offset, and IC39/IC54, for output, as described previously under the appropriate sheet (1, 2, 3 or 4). The active low write enables for these DACs are generated by decoder IC75, the appropriate section of the DAC latch being selected using the address lines A0 and A1.

The AF filters on sheet 3 and demodulation filters on sheet 4 have been described previously. They are loaded with the appropriate parameters by the filter programming logic. Write enables are provided by 4 to 16 line decoder IC75 for the AF filter devices IC28 to IC36 and demodulation filter devices IC43 to IC51.

IC76 and IC77 are programmable dividers that generate the clocks required for the programmable filter circuits on sheets 3 and 4 from the 10 MHz system clock. The required division parameters are latched by AFDIV WR and DMDIV WR signals respectively.

The following tables show the functions of the control signals generated on sheet 6. Where necessary, these are after any further decoding.

IC66 generated control lines

Control Line	Function
AF_SCGN0-2	Sets AF scope gain (see below)
AF_SEL_0-3	Selects AF input (see below)
AFATT1, AFATT2	Sets AF path gain (see below)

AF scope gain control

AF_SCGN2	AF_SCGN1	AF_SCGN0	AF Scope Gain
Low	Low	Low	×100
Low	Low	High	×40
Low	High	Low	×20
Low	High	High	×10
High	Low	Low	×10
High	Low	High	×4
High	High	Low	×2
High	High	High	×1

AF input selection

AF_SEL_2	AF_SEL_1	AF_SEL_0	Input Selected	Function	Scaling
Low	Low	Low	RECON_AF	Reconstructed AF from A5	×0.212
Low	Low	High	AS_F_PWR	Accessory forward power	×0.168
Low	High	Low	AS_R_PWR	Accessory reverse power	×0.168
Low	High	High	MMIN	Multimeter - range 1	×0.500
High	Low	Low	MMIN	Multimeter - range 2	×0.083
High	Low	High	CAL	Calibration	×1
High	High	Low	IC8 pin 6	AF input - front panel	×1
High	High	High	Ground	Calibration	×1

AF path gain control

AFATT2	AFATT1	AF Path Gain
Low	Low	×100
Low	High	×10
High	Low	×10
High	High	×1

IC67/68 derived control lines

Control Line	Function
EM_GN_0-2	Sets external modulation path gain (see below)
DM_SEL_0-3	Selects demodulation input (see below)
AFFILGN0	Sets final AF path gain (Low = ×0.333, High = ×1)
AFFILS0-3	Sets AF filter path through IC31 (see below)

External modulation path gain control

EM_GN2	EM_GN1	EM_GN0	Ext Mod Path Gain
Low	Low	Low	×100
Low	Low	High	×40
Low	High	Low	×20
Low	High	High	×10
High	Low	Low	×10
High	Low	High	×4
High	High	Low	×2
High	High	High	×1

Demodulation input selection

DM_SEL_3	DM_SEL_2	DM_SEL_1	DM_SEL_0	Input	IC67 Q4	IC67 Q3
High	High	High	Low	CAL	Low	Low
High	High	Low	High	Phase Mod	Low	High
High	Low	High	High	FM	High	Low
Low	High	High	High	AM	High	High

AF filter IC31 path control

AFFILS3	AFFILS2	AFFILS1	AFFILS0	IC31 path	IC67 Q7	IC67 Q6
High	High	High	Low	pin 7 to 6	Low	Low
High	High	Low	High	pin 10 to 11	Low	High
High	Low	High	High	pin 15 to 14	High	Low
Low	High	High	High	pin 2 to 3	High	High

Refer to *AF filters* section on page 1-22 for use.

IC69/70/71 derived control lines

Control Line	Function
AFFILS4-7	Sets AF filter path through IC33 (see below)
AFFILS8-11	Sets AF filter path through IC34 (see below)
AFFILS12-15	Sets AF filter path through IC37 (see below)
DMFILS0-3	Sets Demod filter path through IC46 (see below)

AF filter IC33 path control

AFFILS7	AFFILS6	AFFILS5	AFFILS4	IC33 Path	IC69 Q1	IC69 Q0
High	High	High	Low	pin 7 to 6	Low	Low
High	High	Low	High	pin 10 to 11	Low	High
High	Low	High	High	pin 15 to 14	High	Low
Low	High	High	High	pin 2 to 3	High	High

Refer to *AF filters* section on page 1-22 for use.

AF filter IC34 path control

AFFILS11	AFFILS10	AFFILS9	AFFILS8	IC34 Path	IC69 Q3	IC69 Q2
High	High	High	Low	pin 7 to 6	Low	Low
High	High	Low	High	pin 10 to 11	Low	High
High	Low	High	High	pin 15 to 14	High	Low
Low	High	High	High	pin 2 to 3	High	High

Refer to *AF filters* section on page 1-22 for use.

AF filter IC37 path control

AFFILS15	AFFILS14	AFFILS13	AFFILS12	IC37 Path	IC69 Q5	IC69 Q4
High	High	High	Low	pin 7 to 6	Low	Low
High	High	Low	High	pin 10 to 11	Low	High
High	Low	High	High	pin 15 to 14	High	Low
Low	High	High	High	pin 2 to 3	High	High

Refer to *AF filters* section on page 1-22 for use.

Demodulation filter IC46 path control

DMFILS3	DMFILS2	DMFILS1	DMFILS0	IC46 Path	IC69 Q7	IC69 Q6
High	High	High	Low	pin 7 to 6	Low	Low
High	High	Low	High	pin 10 to 11	Low	High
High	Low	High	High	pin 15 to 14	High	Low
Low	High	High	High	pin 2 to 3	High	High

Refer to *Demodulation filters* section on page 1-23 for use.

IC72/73/74 derived control lines

Control Line	Function
DMFILS4-7	Sets Demod filter path through IC48 (see below)
DMFILS8-11	Sets Demod filter path through IC49 (see below)
DMFILS12-15	Sets Demod filter path through IC52 (see below)
DMSCGN0-3	Sets Demod scope attenuator gain (see below)

Demodulation filter IC48 path control

DMFILS7	DMFILS6	DMFILS5	DMFILS4	IC48 Path	IC72 Q1	IC72 Q0
High	High	High	Low	pin 7 to 6	Low	Low
High	High	Low	High	pin 10 to 11	Low	High
High	Low	High	High	pin 15 to 14	High	Low
Low	High	High	High	pin 2 to 3	High	High

Refer to *Demodulation filters* section on page 1-23 for use.

Demodulation filter IC49 path control

DMFILS11	DMFILS10	DMFILS9	DMFILS8	IC46 Path	IC72 Q3	IC67 Q2
High	High	High	Low	pin 7 to 6	Low	Low
High	High	Low	High	pin 10 to 11	Low	High
High	Low	High	High	pin 15 to 14	High	Low
Low	High	High	High	pin 2 to 3	High	High

Refer to *Demodulation filters* section on page 1-23 for use.

Demodulation filter IC52 path control

DMFILS15	DMFILS14	DMFILS13	DMFILS12	IC52 Path	IC72 Q5	IC72 Q4
High	High	High	Low	pin 7 to 6	Low	Low
High	High	Low	High	pin 10 to 11	Low	High
High	Low	High	High	pin 15 to 14	High	Low
Low	High	High	High	pin 2 to 3	High	High

Refer to *Demodulation filters* section on page 1-23 for use.

Demod scope attenuator gain setting

DM_SCGN3	DM_SCGN2	DM_SCGN1	DM_SCGN0	Gain	IC72 Q7	IC72 Q6
High	High	High	Low	×2.5	Low	Low
High	High	Low	High	×1.5	Low	High
High	Low	High	High	×1.25	High	Low
Low	High	High	High	×0.75	High	High

AF, demodulation, and multimeter ranging on A2, A3, and A7

This section shows the setting of the various paths on audio processor boards A2, A3 and A7 for the ranging of the bar charts, oscilloscope and FFT analysis screens for AF, demodulation and multimeter measurements. Note that these are the hardware ranges and not necessarily those being displayed on the screen. Entering the measurement enable diagnostic screen will allow the hardware and software ranges to be tied together for testing.

AF voltmeter barcharts

Range Max	A3 AF Input Attenuator	A3 AF Path Gain	A3 Final AF Gain (IC27)
1 mV	0.9 dB	×100	×1
3 mV	-0.9 dB	×100	×0.333
10 mV	–0.9 dB	×10	×1
30 mV	-0.9 dB	×10	×0.333
100 mV	-0.9 dB	×1	×1
300 mV	–0.9 dB	×1	×0.333
1 V	–40.9 dB	×10	×1
3 V	–40.9 dB	×10	×0.333
10 V	–40.9 dB	×1	×1
30 V	–40.9 dB	×1	×0.333

AF oscilloscope/FFT

Scope Range /div	A3 AF Input Attenuator	A3 AF Scope Gain	Used for FFT Range
2 mV	–0.9 dB	×100	----
5 mV	–0.9 dB	×40	10 mV
10 mV	–0.9 dB	×20	20 mV
20 mV	–0.9 dB	×10	50 mV
50 mV	–0.9 dB	×4	100 mV
100 mV	–0.9 dB	×2	200 mV
200 mV	–0.9 dB	×1	500 mV
500 mV	–40.9 dB	×40	1 V
1 V	–40.9 dB	×20	2 V
2 V	–40.9 dB	×10	5 V
5 V	–40.9 dB	×4	10 V
10 V	–40.9 dB	×2	20 V

Multimeter

Range	A7 Diff Amp Gain	A7 Current Source	A3 AF Input Select Gain	A3 AF Path Gain	A3 Final AF Gain (IC27)
300 mV	×1	----	×0.083	×10	×1
3 V	×1	----	×0.083	×1	×1
30 V	×0.01	----	×0.083	×10	×1
300 V	×0.01	----	×0.083	×1	×1
700 V	×0.01	----	×0.083	×1	×0.333
1 A	×1	----	×0.5	×100	×0.333
10 A	×1	----	×0.5	×10	×0.333
100 Ω	×1	500 µA	×0.5	×10	×1
1 kΩ	×1	500 µA	×0.5	×1	×1
10 kΩ	×1	50 µA	×0.5	×1	×1
100 kΩ	×1	5 µA	×0.5	×1	×1
1 MΩ	×1	0.5 µA	×0.5	×1	×1

Demodulation bar charts

Modulation type	Range	AE7 FM Gain	A3 Demod Attenuator (IC42)	A3 Gain/Loss Setting
FM	1 kHz	×10	×1	+1.4 dB
	3 kHz	×10	×1	+1.4 dB
	10 kHz	×10	×1	–9.0 dB
	30 kHz	×1	×1	+1.4 dB
	100 kHz	×1	×1	–9.0 dB
	300 kHz	×1	×0.5	–12.6 dB
AM	10%	----	×1	+3.0 dB
	30%	----	×1	–6.5 dB
	100%	----	×0.5	–11.0 dB
SSB	AM 100%	----	×0.5	–11.0 dB
Phase	1 rad	×10	×1	+5.1 dB
	3 rad	×10	×1	–4.5 dB
	10 rad	×1	×1	+5.1 dB
	30 rad	×1	×1	–4.5 dB

Note: The gain/loss settings are for no filter.
1 kHz FM range uses the same hardware range as the 3 kHz range.

Demodulation A3 gain/loss setting in dB for filters

Modulation Type	Range	No filter	5, 20 kHz low-pass	300Hz low-pass	Bandpass	C-MESS.	CCITT
FM	1 kHz	+1.4	+1.4	–6.6	–7.4	+11.3	+12.4
	3 kHz	+1.4	+1.4	–6.6	–7.4	+11.3	+12.4
	10 kHz	–9.0	–9.0	–17.0	–17.8	+0.9	+2.0
	30 kHz	+1.4	+1.4	–6.6	–7.4	+11.3	+12.4
	100 kHz	–9.0	–9.0	–17.0	–17.8	+0.9	+2.0
	300 kHz	–12.6	–12.6	–20.6	–21.4	–2.7	–1.6
AM	10%	+3.0	+3.0	–5.0	–5.8	+12.9	+14.0
	30%	–6.5	–6.5	–14.5	–15.3	+3.4	+4.5
	100%	–11.0	–11.0	–19.0	–19.8	–1.1	0.0
SSB	AM 100%	----	–11.0	----	----	----	----
Phase	1 rad	+5.1	+5.1	–3.0	–3.8	+14.9	+16.0
	3 rad	–4.5	–4.5	–12.6	–13.4	+5.3	+6.4
	10 rad	+5.1	+5.1	–3.0	–3.8	+14.9	+16.0
	30 rad	–4.5	–4.5	–12.6	–13.4	+5.3	+6.4

Note: SSB uses 20 kHz low-pass filter only.

AF A3 gain/loss setting in dB for filters

Filter	Gain/Loss Setting
None	–25.0 dB
20 kHz low-pass	+9.1 dB
300Hz low-pass	+1.0 dB
Band-pass	–1.5 dB
C-MESS.	+18.3 dB
CCITT	+20.1 dB
2 kHz low-pass	+9.1 dB

Demodulation oscilloscope

Mod Type	Range per Div.	AE7 FM Gain	A3 Demod Attenuator (IC42)	A3 Gain/Loss Setting	A3 Scope Attenuator	Used for FFT Range
FM	500Hz	×10	×1	+1.4 dB	×1.5	1 kHz
	1 kHz	×10	×1	–9.0 dB	×2.5	2 kHz
	2 kHz	×10	×1	–9.0 dB	×1.25	5 kHz
	5 kHz	×1	×1	+1.4 dB	×1.5	10 kHz
	10 kHz	×1	×1	–9.0 dB	×2.5	20 kHz
	20 kHz	×1	×1	–9.0 dB	×1.25	50 kHz
	50 kHz	×1	×0.5	–12.6 dB	×1.5	100 kHz
	----	×1	×0.5	–12.6 dB	×0.75	200 kHz
AM	----	----	×1	+3.0 dB	×2.5	5%
	----	----	×1	+3.0 dB	×1.25	10%
	5%	----	×1	–6.5 dB	×1.5	20%
	10%	----	×0.5	–11.0 dB	×2.5	50%
	20%	----	×0.5	–11.0 dB	×1.25	100%
Phase	0.5 rad	×10	×1	–4.5 dB	×1.5	1 rad
	1 rad	×1	×1	+5.1 dB	×2.5	2 rad
	2 rad	×1	×1	+5.1 dB	×1.25	5 rad
	5 rad	×1	×1	–4.5 dB	×1.5	10 rad
	----	×1	×1	–4.5 dB	×0.75	20 rad

Note: The gain/loss settings are for no filter.

A4 PPH, RTP and TTP board

Circuit diagrams: Fig. 7-58 to 7-62

Introduction

A4, A8 and AB3 together provide the circuits required by the 2966A digital systems. The A4 board has on it the Protocol Processor/Host (PPH), Transmit Traffic Processor (TTP) and Receive Traffic Processor (RTP).

Protocol processor/host (PPH)

This subsection describes the functioning of the PPH part of A4. The PPH performs several functions:-

1. Reset and boot-up of the various Digital Signal Processors (DSPs) used on A4 and A8.
2. Configuration of the Field Programmable Gate Arrays (FPGAs) used on A4 and A8.
3. Communication with A6, the main processor, and the various other DSPs on A4 and A8. This allows measurement modes to be set up and measurement results to be displayed.

A block diagram of the PPH is shown in Fig. 1-4. This shows the essential sub-systems that form the complete system. Referring to Fig. 1-4, the processor used is a 68000 microprocessor that is clocked at 10 MHz by a clock source on A8. It is interfaced to the sub-systems described below.

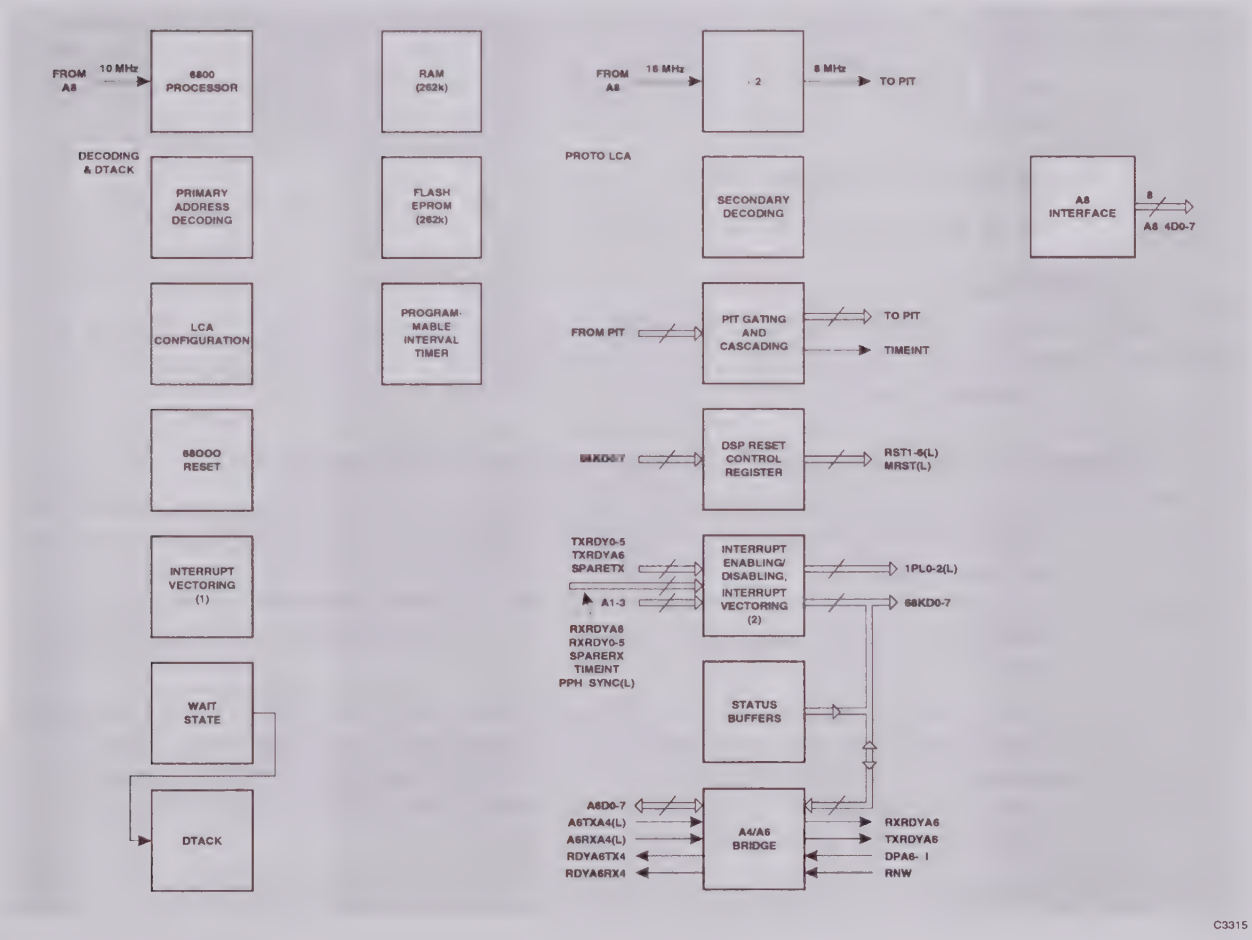

Fig. 1-4 Block diagram of PPH

A4 memory

The 68000 addresses 256K of static RAM and 256K of Flash EPROM. The Flash EPROM memory capacity is expandable to 1 Mbyte.

Decoding and DTACK

The block labelled DECODING AND DTACK is contained in an EPLD. It performs the main address decoding. The decodes produced are described in the *Software interface* section of this technical description - see page 1-42.

The DTACK (Data Transfer Acknowledge) logic provides a data transfer acknowledge signal to the 68000 for each transfer to/from a valid peripheral. Most of the peripherals can be accessed without the need for the WAIT STATE block.

In the case of relatively slow peripherals, such as the Programmable Interval Timer (PIT) and when configuring Logic Cell Arrays (LCAs), the DTACK(L) signal is delayed by the WAIT STATE block, producing two wait state periods.

The INTERRUPT VECTORING (1) block initiates an interrupt acknowledge sequence by decoding signals FCO-2 from the 68000. It responds by asserting INTVEC(L). This signal drives further interrupt logic inside the PROTO LCA, producing an interrupt vector on 68KD0-7, and DTACK(L) is asserted.

The EPLD also contains certain miscellaneous functions, 68K RESET and LCA CONFIGURATION. The 68K RESET block produces open-collector signals HALT(L) and RESET(L) in response to the SYSRES(L) signal from A6.

The LCA CONFIGURATION block is used so that the 68000 can transfer the configuration patterns for the various XILINX FPGAs or LCAs contained on boards A4 and A8. These devices are SRAM-based and need configuring at power-up. The PROTO LCA contained on this board and the FIFO LCA on A8 are configured with the aid of this block.

Programmable interval timer (PIT)

This is used to generate periodic interrupts.

PROTO LCA

Various pieces of "glue logic" are contained in this block. It is implemented in a XILINX XC3030 device which contains 100 CLBs (Configurable Logic Blocks) and 80 IOBs (Input/Output Blocks).

Transmit traffic processor (TTP) and receive traffic processor (RTP)

The TTP maintains the BCCH and TCH frame structures. Layer 2 messages received from the PPH via the bridge interface are inserted in the appropriate elements of the frame structure. In response to interrupts from the STE, the TTP performs the required bit shuffling and convolutional coding to create the data bits for a single TDMA burst; these are fed to the IGP (page 1-81) and QGP (page 1-81) via the SPORT loop, where the bits are modulated on the RF carrier.

The RTP receives demodulated data bits from the RDP (page 1-82) over the SPORT loop on a burst by burst basis. Reversing the TTP's bit shuffling and convolutional coding, the RTP recreates the Layer 2 signalling streams, which are then passed to the PPH via the bridge interface. The RTP also handles data comparisons for BER and RBER testing, passing error reports to the PPH, again via the bridge interface.

Circuit description

System reset (sheet 1)

The 68000 is reset by asserting its HALT(L) and RESET(L) lines simultaneously. These two lines are bidirectional and must therefore be driven by open-collector sources. The reset function is implemented inside IC6.

The DSCRES(L) input of IC6 is driven by the SYSRES(L) system reset line produced by A6. IC6 produces two open-collector outputs, RES68K_L and HALT68K_L, as defined by the equations in lines 397 to 401 of the ABEL4 listing (page 1-50).

Address decoding (sheets 1 and 2)

Address decoding is described in the ABEL4 listing. This is supplemented by the notes below.

ROM decodes

128K Flash EPROMs are fitted in positions IC4 and IC9.

PLAQ (sheet1) is provided to enable external EPROMs to be accessed. The external EPROMs will contain Flash programming, boot-up and diagnostic code. This allows totally blank Flash EPROMs to be fitted in positions IC4 and IC8. The Flash programming algorithms can then be written to the boot sectors (800000h to 8007FFh) along with the vector table addresses and any other necessary boot code. The EPROMs can then be fully programmed in the test set.

IC6 produces upper and lower Chip Select signals for the Flash EPROMs; ROMUCS(L) and ROMLCS(L) respectively. It also produces ROMOE(L), which drives the OE(L) pins of the Flash EPROMs. The 68000 read/write signal RNW drives the WE(L) pins of the EPROMs. The Flash EPROMs are erased and programmed on a byte-wide basis.

Operating mode	CE(L)	OE(L)	WE(L)
Read	L	L	H
Program	L	H	L
5 V chip erase	L	H	L

To program or erase the Flash EPROM, it is necessary to write to EPROM address 2AAAh. This address corresponds to 68000 address 805554,5h, which during normal use lies within the write-protected boot sector. IC30 and IC31(a) provide the additional address decoding needed for address 805554,5h via the signal DEC_2AAA(L), which drives IC6 pin 13.

The EXTROM_EN(L) input of IC6 is driven by PLAQ pin 49. When a boot card is fitted to PLAQ, PLAQ pin 49 is grounded, which causes the external ROM on the boot board to be accessed by the decode output EXTROMCS(L) instead of the Flash EPROMs for a read address range of 0 to 0FFFFFh. The boot board provides a power on reset for the 68000 via PLAQ pin 27 which drives the DSCRES(L) input of IC6.

The implementation of the ROM decoding is detailed in lines 215 to 249 and 314 to 325 of the ABEL4 listing (page 1-50).

RAM decodes

Two RAM Chip Selects are produced; RAMU_L drives the CS1(L) input of IC9, the upper byte RAM and RAML_L drives the CS1(L) input of IC5, the lower byte RAM. The present total RAM size is 256 kbytes, this is expandable to 1 Mbytes by fitting 512K RAMs, R106 and R127 to 129.

The equations and declarations for these decodes are shown in lines 252-256 and 326-327 of the ABEL4 listing (page 1-50). The upper/lower decodes are obtained by qualifying with UDS_L and LDS_L respectively.

Bridge decodes

IC6 produces a general bridge decode signal named BRIDGE(L). This is active for separate read and write addresses as described in lines 259-263 and 329 of the ABEL4 listing (page 1-50). BRIDGE(L) enables the decoder IC26, which decodes address signals A1-3, producing seven bridge decodes. The decoder signals RTPBRI(L) and TTPBRI(L) drive bridges shown on sheet 3 and sheet 4 respectively. A4A6BRI(L) drives the PROTO LCA on sheet 2.

The other bridge decodes drive bridges on A8 and are connected via PLC. An A8 enable signal, A8EN_L, is produced which is active when one of the above decodes is active. It is also active when the STE LCA contained on A8 is addressed. This enable signal is described in line 331 of the ABEL4 listing (page 1-50). A8EN_L drives the G(L) pin bus transceiver, IC3, which interfaces A4 68KD0-7 to A8_4D0-7.

PROTOLCARD(L)

This decode is a read decode which drives the PROTOLCARD (L) input of IC7, as detailed in lines 270 and 330 of the ABEL4 listing (page 1-50). Address lines A1-3 from IC2 also drive IC7.

PROTOLCAWR(L)

This decode is a write decode which drives the PROTOLCAWR(L) input of IC7 where further decoding is performed as above. This decode is also used to configure the PROTO LCA and is detailed in lines 265-268 and 334 of the ABEL4 listing (page 1-50).

STECS(L)

This decode is a read/write decode which drives the STE LCA on A8. See lines 276-277 and 338 of the ABEL4 listing (page 1-50) for details. Address lines A1-5, buffered by IC23(d)-(g) and IC31(b), drive A8. The decode and the buffered address lines are decoded further inside the STE LCA.

PITCS(L)

PITCS(L), PITWR(L) and PITRD(L) are produced as shown in lines 284-5 and 340-2 of the ABEL4 listing (page 1-50). These signals drive the CS(L), WR(L) and RD(L) inputs respectively of the 82C54 PIT. The RD(L) and WR(L) signals are produced by feeding back the PITCS(L) output into the EPLD and gating with RNW. This ensures that the gated signals go low after PITCS(L) goes low.

Latched decodes (sheets 1 and 2)

The decoder EPLD PROTODEC, IC6, produces the following decodes:-

PROTORES(L)

This output drives the RESET pin of the PROTO LCA (and the PROG(L) pins of the XC4000 LCAs on A8 via signal PRES(L)). The reset must be sustained for at least 6 µs and so is latched. It is also open-collector so that an external reset from a XILINX Xchecker cable can be used when debugging.

The decoded address PROTOCLK clocks a D-type flip-flop, whose D input is driven by 68KD0. The flip-flop Q output is inverted and drives the .oe pin of a tri-state output buffer whose input is grounded. Thus the output PROTORES_L is open-collector. Writing a low into PROTOCLK bit 0 grounds PRES(L), writing a high causes PRES(L) to be pulled high by R205. See lines 274 and 344-356 of the ABEL4 listing (page 1-50).

At power up, PROTORES(L) is initialised as high by the SYSRES(L) signal from A6.

PROTODNP(L)

This signal drives the DNP pin of IC7. It is also connected to the DNP lines of the other LCAs on A8 that are part of the configuration daisy chain. It is latched and open-collector, as for PROTORES(L), and is implemented in lines 344-356 of the ABEL4 listing (page 1-50).

At power up PROTODNP(L) is initialised as high by the SYSRES(L) signal from A6.

STATUS1 (sheets 1 and 2)

The STATUS1 output from IC6 drives the enable lines of IC27 where the status of the signals below are monitored by the 68000. It is implemented by means of lines 268 and 347 of the ABEL4 listing (page 1-50).

PINIT(L)

The PINIT(L) line is driven by the INIT(L) output of the PROTO LCA through the PINIT(L). This line is held low by the LCAs during the clearing of their configuration memories. The writing of LCA configuration data must be delayed until this line is high.

It is read on 68KD1 when STATUS1 is read, via IC27.

PDNP

The PDNP line is read on 68KD2 when the 68000 reads STATUS1 via IC27.

PRDY

The READY/BUSY(L) output of IC7 (sheet 2) indicates during configuration when the PROTO LCA is ready for another byte of configuration data to be sent. The signal drives IC27 pin 5 and its status appears on 68KD3 when STATUS1 is read.

LDC1-4

The LDC (low during configuration) signals are output by each LCA in the configuration chain and can be used to help solve configuration problems. These signals provide information as to which LCA has failed to configure.

LDC1 is output by IC7, LDC2 is the FIFO LCA on A8, and LDC3 is the STE LCA on A8. LDC4 is presently unused. These signals drive IC27 and their states appear on 68KD4-7 when STATUS1 is read.

Wait state logic (sheet 1)

The wait state logic is contained in the PROTODEC, IC6. It is described by lines 296 and 360-363 of the ABEL4 listing (page 1-50). It consists of two flip-flops WA and WB. WA is clocked by the 10 MHz system clock, CLK10M. WB is clocked by CLK10M inverted. AS(L) drives the data input of WA. WA drives the data input of WB. WA and WB are effectively ORed and feed the DTACK(L) logic.

The waveform diagram Fig. 1-5 on page 1-38 shows the functioning of the wait state logic.

The WAIT signal is high for states 2 to 4. This signal drives the DTACK logic. Any decode can be subjected to two wait states by delaying its DTACK(L) with the WAIT signal. DTACK(L) is sampled at the end of state 4. If high, wait states (shown as W in Fig. 1-5) are substituted for states 5 and 6. DTACK(L) goes low after WAIT goes low and normal states (i.e. 5-7) are resumed after the two wait states.

DTACK logic (sheet 1)

The acknowledgement of data transfers is necessary for the 68000 to complete its read or write cycle. This is done by pulling the 68000 DTACK(L) signal low. DTACK(L) is formed from four open-collector outputs on the PROTODEC, IC6. The signal is pulled high by R104 when all DTACK(L) sources are inactive.

The DTACK logic is described by lines 369-391 of the ABEL4 listing (page 1-50). Four outputs are needed because of the large number of product terms that must be ORed together. Read DTACKs are generated by gating the appropriate decode address with either UDS(L) or LDS(L). Write DTACKs are generated by gating the decode address with AS(L) and RNW.

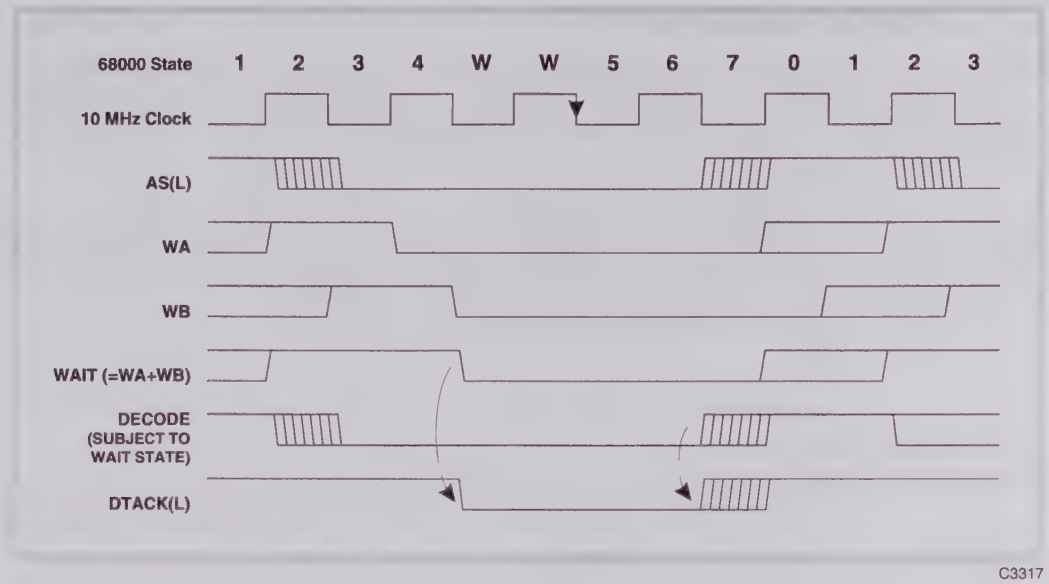

Fig. 1-5 Wait state logic waveforms

Interrupt acknowledge logic (sheet 1)

The board was designed to support two acknowledge modes, vectored and auto-vectored. For auto-vectoring, R110 would be fitted. Current instruments use the vectored mode, so R110 is not fitted.

When R110 is not fitted, AUTOVEC(L) is high due to R115, and line 395 of the ABEL4 listing (page 1-50) applies. The function code signals FC0-2 from the 68000 drive the DECODER EPLD and are high during an interrupt acknowledge cycle, also AS(L) is low. This causes INTVEC(L) to go low. INTVEC(L) drives the PROTO LCA. The LCA generates the required vector on 68KD0-7. DTACKB is pulled low by IC6 (line 378 of the ABEL4 listing, page 1-50). The interrupt DTACK is subjected to two wait states to ensure valid interrupt vectors are generated by PROTO LCA.

Bus error logic (sheet 1)

The bus error logic on the PROTODEC is designed to flag a bus error to the 68000 if it attempts to access an invalid address.

The declarations for the bus error logic are described in lines 291-306 of the ABEL4 listing (page 1-50). The equations are described in lines 404-424.

The system so formed is a state machine clocked on high to low transitions of clk10m. The bus error logic detects invalid address accesses by monitoring the four dtack pins. An invalid address access does not produce a DTACK. The state machine has 3 states. State A is the idle state. State C indicates a valid address access and State B indicates an invalid address access. State D is an invalid condition that might occur at power-up, in which case the state machine unconditionally jumps to State A.

The timing of the examination of DTACK is achieved with the wait state logic. Referring to Fig. 1-5 on page 1-38, the internal signal wait is low after 68000 state 4. On the next 10 MHz high-to-low transition (indicated by a downward arrow), DTACK is sampled.

Valid address access

A valid address access will produce a DTACK and the state machine will jump from State A to C. Internal EPLD signal wait goes high during 68000 states 0, 1 or 2 (AS(L) timing dependent), at which time the state machine reverts to State A.

Invalid address access

No DTACK is produced, in which case internal signal dtack_exists is low. Consequently the state machine jumps from State A to State B. During State B, the EPLD berr_l signal is low. This signal drives the BERR(L) input of the 68000, which responds by negating its AS(L) signal and initiates a bus error exception. The negation of AS(L) causes internal EPLD signal dtack_cycle to go low, and the state machine reverts to State A.

Read-modify-write access

The bus error logic will work for zero wait state read-modify-write accesses. First the read cycle, if valid, invokes State C, otherwise State B. Second, if State C is reached, it is maintained until the internal EPLD signal wait goes high, when it reverts to State A. If the write cycle is invalid, no DTACK is produced and the state machine jumps to State B, giving rise to a bus error etc.

PROTO LCA (sheet 2)

The 8 MHz clock for the PIT is provided by dividing the 16 MHz clock from A8. The various gating signals to trigger each stage of the PIT are provided. The PIT OUT signals are gated inside the PROTO LCA to form 68000 interrupts.

The DSP RESET CONTROL REGISTER provides a means of independently initialising the following DSPs:-

- On A4: Receive Traffic Processor (RTP) and Transmit Traffic Processor (TTP).
- On A8: Modulation Analysis Processor (MAP), In-phase modulation Generation Processor (IGP), Quadrature modulation Generation Processor (QGP) and Real-time Demodulation Processor (RDP).

The INTERRUPT ENABLING/DISABLING block accepts the various DSP bridge flags and the PIT TIMEINT flag as potential interrupt sources that can be enabled or disabled. These flags are logically combined and drive an interrupt priority encoder contained in the block. Outputs IPL0-2(L) interrupt the 68000.

Provided that the pending interrupt level exceeds the level set in the 68000 status register (apart from level 7, which is non-maskable), the interrupt acknowledge sequence is initiated by the 68000:-

- The 68000 outputs the interrupt acknowledge function code on FC0-2.
- This and AS(L) are decoded by the EPLD, producing signal INTVEC(L).
- The interrupt level is echoed on address lines A1-3.

INTVEC(L), A1-3 and the enabled flags are decoded to produce a unique interrupt vector on 68KD0-7. Also DTACK(L) is asserted to indicate completion of the data transfer.

The block shown in Fig. 1-4 as STATUS BUFFERS enables the state of the following groups of signals to be read by the 68000:-

INT1-6	Enabled interrupt lines internal to PROTO LCA
MISCINT	Enabled interrupt lines internal to PROTO LCA
TXFLAGs	External bridge flags
RXFLAGs	External bridge flags
Miscellaneous flags	

The A4/A6 BRIDGE permits data communication between the main processor board A6 and A4. The facilities available are described in the *Software interface* section of this report - see page 1-42.

A4/STE functions (sheet 2)

A4 initialises the A8 Systems Timing Element (STE), described on page 1-82, by writing to it through A8_4D0-7 (PLB, PLC). The following functions are provided:-

- Independent control of the various DSP clocks, 10 MHz and 40 MHz clocks.
- Control of the DSP SPORTS; routing and serial clock enabling.
- Control of the various system clocks, such as reference frequency, frame clock, slot clock, symbol clock and sample clock.
- Control of the various sync lines; RF_SYNC, RDP_SYNC, QGPSYNC, IGP_SYNC, MAPSYNC, RTP_SYNC and RTP_SYNC. Routing and level is controllable for each sync source.
- Control of the modulation generator phase-locked loop (PLL).
- Control of the A8 generator output level.
- Configuration of the FLEX chips used on A8.

LCA configuration and readback (sheets 1 and 2)

The configuration patterns for the LCAs are contained in the EPROMs. The LCAs are normally loaded under control of the 68000 after reset/power-up. They can also be loaded and read back from a PC through PLW.

Configuration by 68000

On sheet 2, the configuration mode of the PROTO LCA is selected with mode pins M0, M1 and M2. M0 and M2 are driven high by R206 and 207, M1 is pulled low by R201 and 202. This selects the byte-wide peripheral configuration mode. Configuration write cycles are decoded from the common assertion of the WS(L) and the Chip Select pins CS0(L), CS1(L) and CS2. WS(L) is driven by RNW, CS0(L) by PROTOLCAWR(L) from the IC6, CS1(L) by A1 from the 68000, CS2 by A2. The configuration data is written to the D0-7 inputs of the LCA. These inputs are connected to 68KD0-7.

Following a system reset, the 68000 executes code to configure the PROTO LCA and the FIFO and STE LCAs on A8. It first sets PRES(L) and PDNP by means of the IC6. It then pulls these two open-collector signals low for at least 6 µs and then releases them. Each LCA responds by performing an internal configuration clear operation. The PROTO LCA signals that this operation is in progress by asserting INIT(L). This signal drives IC27 pin3, which is polled by the 68000.

When this line is polled as high, the 68000 writes the first byte of configuration data to the PROTO LCA. The LCA responds by taking its RDY/BUSY(L) line low. When ready for another byte of configuration data this line is asserted high. The 68000 polls this line and sends successive bytes of configuration data.

The PROTO LCA is eventually configured, and it then passes further configuration data that it receives to the second LCA in the configuration chain (on A8) by means of its CCLK and DOUT pins. The other LCAs have their mode pins wired high, which places them in bit serial slave configuration mode. When the second LCA is configured, it passes further configuration data to the third LCA, etc.

Eventually all LCAs in the chain are configured and the wired AND DNP lines go high. This signal feeds the IC27 pin 4, which can be read by the 68000 as a confidence check. The LDC signals (low during configuration) can also be monitored via IC 27 as a further confidence check.

At this stage in the configuration process, the PROTO LCA is completely configured and the two LCAs on A8 are nearly configured. They require one further CCLK pulse to complete the configuration. This is achieved by means of extra CCLK logic in the PROTO LCA.

Readback

The PROTO LCA can be read back and internal nodes can be probed using the XChecker cable connected to PLW via a suitable adaptor. PLW pin 11 drives the M0/RTRIG pin of the LCA. The PC pulls this pin low to trigger a readback. The LCA outputs the readback data on M1/RDATA, which connects to PLW pin 10.

Receive (uplink) traffic processor (RTP) (sheet 3)

The RTP is based around the ADSP2115 DSP, IC11. ICs 12 and 13 are 32K x 8 RAMs, IC14 is an 8K x 8 RAM. These are mapped through the memory decoder PAL, IC15, to provide 8K of 24-bit external program memory, 6K of 16-bit external program memory for data storage, and 13K of 16-bit external data memory for data storage.

The fast external memory, with 15 ns access time, must operate with zero wait states, so the memory decoder has a propagation delay of less than 10 ns. A single I/O decode enables the bridge controller (see below) for RTP to M68000 communication. PMEN enables external RAM during data and program memory access. PMXEN enables the extended external memory (IC14) during external program memory access. The memory decoder design supports paged operation, in this unpaged application, the unused inputs are tied low through a 10 kΩ resistor, R314, and unused outputs are tied high through 10 kΩ pull-up resistors R316..320.

IC16 is a Programmable Logic Array (PLA), known as the bridge controller, which provides a bidirectional, 8-bit data link between the RTP and the 68000 host processor. The bridge controller contains internal registers for flow control and interrupt generation and drives and external 8-bit 74FCT652 transceiver, IC28. The bridge controller may raise an interrupt via the RTP's /IRQ0 pin.

The bridge controller also provides four auxiliary outputs, R_AUX0..3, which can be written to by the DSP for debug purposes.

DSP reset is controlled by the M68000 host processor.

The 16 MHz DSP clock is provided on SKA from A8.

The RTP's /IRQ2 pin may be driven by the /RTP_SYNC signal taken from the STE on A8.

The RTP's serial port receives from the RDP on A8 via PLJK and sends to the CODEC port on the accessory socket via PLE (sheet 5). It may also output to the TTP's serial port input.

Transmit (downlink) traffic processor (TTP) (sheet 4)

The TTP is similar in most respects to the IGP (page 1-81) with the exception of the SPORT routing.

Serial port data and sync (T_DR0, T_RFS0) is received via IC25 (sheet 5), which multiplexes the signals either from the RTP's serial output or from the CODEC serial port routed in via PLE. Sourcing of the serial port input is controlled via the T_AUX3 output of IC22, which controls the multiplexer IC25 (sheet 5).

The serial port transmits to A8 via PLJK where it is routed to the IGP or IGP and QGP on A8 - the necessary routing takes place on A8.

Furthermore, the TTP's serial clock is configured as an output and becomes the DSP SPORT clock master for the remaining five DSPs in the system.

DSP clock distribution (sheet 5)

IC24, a 74HC365 CMOS buffer, distributes the 16 MHz DSP processor clock, which is received on SKA, to the two DSPs on A4 and to PLJK, where it is fed to A8 and further buffered to the four DSPs on that board.

IC24 also buffers the DSP SPORT clock master to the RTP, A8 and the CODEC port.

The series resistors in each clock distribution line prevent ringing. All clock lines are terminated with a single receiver.

IC25 is a 74AC157 multiplexer which sources the TTP SPORT receive data and receive frame sync either from the external CODEC connector (PLE), or from the RTP's SPORT transmitter. Multiplexer routing is controlled by the TTP's T_AUX3 control line.

A4 software interfaces

68000 memory map

The decodes accessing the STE, PIT and LCA configuration decodes are subject to two wait states, others are not subject to any wait states.

Key to table below: B/W means byte/word, RO/WO/RW means read only/write only/read write.

Address Range	B/W	Decode	RO/WO/ RW	Comments
000000h-03FFFFh	B/W	Flash	RO	Normal use, Flash read address range.
808000h-83FFFFh	B/W	Flash	RW	Normal use, address range for programming or verification by A6.
805554,5h	B/W	Flash_2aaa	W	Address is part of Flash "unlock programming sequence".
800000h-83FFFFh	B/W	Flash	RW	Flash address range with boot board fitted.
0 - 3FFFFh	W	EXT ROM	RO	External ROM on bootcard enabled when fitted.
600000h-63FFFFh	B/W	RAM	RW	RAM, ram expansion resistor not fitted.
600000h-6FFFFFh	B/W	RAM	RW	RAM, ram expansion resistor fitted.
E00001h-E0000Dh	B		WO	Bridge write decodes. Produce general bridge Chip Selects, which are decoded externally as shown below:-
E00001h	B	rdpbri	WO	RDP bridge
E00003h	B	qgpbri	WO	QGP bridge
E00005h	B	igpbri	WO	IGP bridge
E00007h	B	mapbri	WO	MAP bridge
E00009h	B	rtpbri	WO	RTP bridge
E0000Bh	B	ttpbri	WO	TTP bridge
E0000Dh	B	a4a6bri	WO	A4/A6 bridge
E0000Fh	B	protoclk	WO	drives reset and dnp flip-flops
E00011h	B	pitctr0	WO	(1 wait state, write address)
E00013h	B	pitctr1	WO	(1 wait state, write address)
E00015h	B	pitctr2	WO	(1 wait state, write address)
E00017h	B	pitconreg	WO	(1 wait state, write address)
E0001Dh	B	protocs0	WO	Via pin protolcawr - allows configuration of PROTO LCA (1 wait state).
E00021h-E00029h	B	PROTOLCAWR	WO	Write decode that drives the PROTO LCA where PROTOLCARD and A1:4 are further decoded in the PROTO LCA as follows:-

E00021h	B	RESCONT	WO	Used to independently reset DSPs.
E00023h	B	TXINTEN	WO	Used to independently enable/disable bridge Tx interrupts
E00025h	B	RXINTEN	WO	Used to independently enable/disable bridge Rx interrupts
E00027h	B	MISCINTEN	WO	Used to independently enable/disable miscellaneous interrupts
E00029h	B	TCRREG	WO	Controls 82C54 GATE0 drive, can reset timer interrupts
E00031h-E0004Fh	B	STECS	WO	Used to write to STE LCA where STECS A1-4 are further decoded as shown below:-
E00031	B			Synthesizer N reg.high byte
E00033	B			Synthesizer N reg. low byte
E00035	B			Pri. attenuator high byte
E00037	B			Pri. attenuator low byte
E00039	B			Sec. attenuator high byte
E0003B	B			Sec. attenuator low byte
E0003D	B			O/p attenuator control reg.
E0003F	B			JTAG port control.
E00041	B			Instrument clock control
E00043	B			Serial port control
E00045	B			System clock control
E00047	B			Synchronization control
E00049	B			Synchronization level
E0004B	B			Synthesizer C reg.
E0004D	B			Synthesizer R reg. high byte
E0004F	B			Synthesizer R reg. low byte
F00001h-F0000Dh	B	Bridge read decodes		Produce general bridge Chip Selects, which are decoded externally as shown below:-
F00001h	B	rdpbri	RO	
F00003h	B	qgpbri	RO	
F00005h	B	igpbri	RO	
F00007h	B	mapbri	RO	
F00009h	B	rtpbri	RO	
F0000Bh	B	ttpbri	RO	
F0000Dh	B	a4a6bri	RO	
F0000Fh	B	status1	RO	Allows reading of LCA configuration lines;rdy, init, dnp and ldc pins.
F00011h	B	pitctr0	RO	(1 wait state, readaddress)
F00013h	B	pitctr1	RO	(1 wait state, read address)
F00015h	B	pitctr2	RO	(1 wait state, read address)
F00017h	B	pitstatreg	RO	(1 wait state, read address)

Address Range	B/W	Decode	RO/WO/ RW	Comments
F00021h-F00025h	B	PROTOLCARD		Read decode that drives the PROTO LCA where PROTOLCARD and A1:3 are further decoded in the PROTO LCA as follows:-
F00021h	B	TXRDYREG	RO	Bridge TX ready register
F00023h	B	RXRDYREG	RO	Bridge RX ready register
F00025h	B	status2	RO	Status buffer, TIMEINT and PPH_SYNC
F00031h-F0004Fh	B	STECS	RO	Used to read STE LCA, where STECS and A1-4 are further decoded as shown below:-
F00031	B			Synthesizer N reg. high byte
F00033	B			Synthesizer N reg. low byte
F00035	B			Pri. attenuator high byte
F00037	B			Pri. attenuator low byte
F00039	B			Sec. attenuator high byte
F0003B	B			Sec. attenuator low byte
F0003D	B			O/p atten. control reg
F0003F	B			JTAG port control
F00041	B			Instrument clock control
F00043	B			Serial port control
F00045	B			System clock control
F00047	B			Synchronization control
F00049	B			Synchronization level
F0004B	B			Synthesizer C reg.
F0004D	B			Synthesizer R reg. high byte
F0004F	B			Synthesizer R reg. low byte

Bit maps

TXRDYREG bit map

This register is read only.

68K Bit	Name	Function
0	SPA_TXRDY(L)	Presently unused
1	RDP_TXRDY(L)	Ready for 68000 to transmit to RDP bridge if low.
2	QGP_TXRDY(L)	Ready for 68000 to transmit to QGP bridge if low.
3	IGP_TXRDY(L)	Ready for 68000 to transmit to IGP bridge if low.
4	MAP_TXRDY(L)	Ready for 68000 to transmit to MAP bridge if low.
5	RTP_TXRDY(L)	Ready for 68000 to transmit to RTP bridge if low.
6	TTP_TXRDY(L)	Ready for 68000 to transmit to TTP bridge if low.
7	A6_TXRDY(L)	Ready for 68000 to transmit to A4/A6 bridge if low.

Following power up/reset, the flags are low.

RXRDYREG bit map

This register is read only.

68K Bit	Name	Function
0	SPA_RXRDY(L)	Presently unused
1	RDP_RXRDY(L)	Ready for 68000 to receive from RDP bridge if low.
2	QGP_RXRDY(L)	Ready for 68000 to receive from QGP bridge if low.
3	IGP_RXRDY(L)	Ready for 68000 to receive from IGP bridge if low.
4	MAP_RXRDY(L)	Ready for 68000 to receive from MAP bridge if low.
5	RTP_RXRDY(L)	Ready for 68000 to receive from RTP bridge if low.
6	TTP_RXRDY(L)	Ready for 68000 to receive from TTP bridge if low.
7	A6_RXRDY(L)	Ready for 68000 to receive from A4/A6 bridge if low.

Following power up/reset, the flags are high.

STATUS1 bit map

This register is read only.

68KBit	Name	Function
1	PINIT(L)	During LCA configuration, if clear it indicates that the LCAs are busy clearing their configuration memories. Configuration should be delayed until this status line is polled as high.
2	PDNP	If polled low it indicates that LCA configuration is still in progress. If polled as high, configuration is complete. Failure of this line to go high after transmission of configuration data indicates LCA configuration problems.
3	PRDY	During LCA configuration, if set, it indicates that the PROTO LCA is ready for another byte of configuration data from the 68000.
4	LDC1	Low during configuration status from the PROTO LCA. It goes high when this LCA has configured.
5	LDC2	Low during configuration status from the FIFO LCA on A8. It goes high when this LCA has configured.
6	LDC3	Low during configuration status from the STE LCA on A8. It goes high when this LCA has configured.
7	LDC4	Presently unused.

The LDC status signals can be used to help solve LCA configuration problems.

STATUS2 bit map

This register is read only.

68KBit	Name	Function
0	TIMERQ0	Latched signal indicating detection of end of a timer period from PIT counter 0.
1	TIMERQ1	Latched signal indicating detection of end of a timer period from PIT counter 1.
2	TIMERQ2	Latched signal indicating detection of end of a timer period from PIT counter 2.-
3	PPH_SYNC(L)	Synchronization signal from A8. Currently unused.

RESCONT bit map

This register is write only.

68KBit	Name	Function
1	RDP_RST(L)	RDP DSP reset, active if register bit is clear.
2	QGP_RST(L)	QGP DSP reset, active if register bit is clear.
3	IGP_RST(L)	IGP DSP reset, active if register bit is clear.
4	MAP_RST(L)	MAP DSP reset, active if register bit is clear.
5	RTP_RST(L)	RTP DSP reset, active if register bit is clear.
6	TTP_RST(L)	TTP DSP reset, active if register bit is clear.
7	MRST(L)	Miscellaneous reset, active if register bit is clear.

All register bits are clear after the PROTO LCA has configured. A particular reset is released by writing a high to the appropriate RESCONT bit.

TXINTEN bit map

This register is write only.

68KBit	Name	Function
0	SPA_TXEN	When set, enables SPA_TXRDY(L), the spare bridge TX flag as an interrupt source.
1	RDP_TXEN	When set, enables the RDP_TXRDY(L) flag as an interrupt source.
2	QGP_TXEN	When set, enables the QGP_TXRDY(L) flag as an interrupt source.
3	IGP_TXEN	When set, enables the IGP_TXRDY(L) flag as an interrupt source.
4	MAP_TXEN	When set, enables the MAP_TXRDY(L) flag as an interrupt source.
5	RTP_TXEN	When set, enables the RTP_TXRDY(L) flag as an interrupt source.
6	TTP_TXEN	When set, enables the TTP_TXRDY(L) flag as an interrupt source.
7	A6_TXEN	When set, enables the A6_TXRDY(L) flag as an interrupt source.

After LCA configuration the above register bits are all clear.

RXINTEN bit map

This register is write only.

68KBit	Name	Function
0	SPA_RXEN	When set, enables SPA_RXRDY(L), the spare bridge RX flag as an interrupt source.
1	RDP_RXEN	When set, enables the RDP_RXRDY(L) flag as an interrupt source.
2	QGP_RXEN	When set, enables the QGP_RXRDY(L) flag as an interrupt source.
3	IGP_RXEN	When set, enables the IGP_RXRDY(L) flag as an interrupt source.
4	MAP_RXEN	When set, enables the MAP_RXRDY(L) flag as an interrupt source.

5	RTP_RXEN	When set, enables the RTP_RXRDY(L) flag as an interrupt source.
6	TTP_RXEN	When set, enables the TTP_RXRDY(L) flag as an interrupt source.
7	A6_RXEN	When set, enables the A6_RXRDY(L) flag as an interrupt source.

After LCA configuration, the above register bits are all clear.

MISCINTEN bit map

This register is write only.

68KBit	Name	Function
0	TIMER0EN	When set, enables the PIT counter 0 flag as an interrupt source.
1	TIMER1EN	When set, enables the PIT counter 0 flag as an interrupt source.
2	TIMER2EN	When set, enables the PIT counter 0 flag as an interrupt source.
3	PPH_SYNCEN	When set enables the PPH SYNC signal from A8 as an interrupt source. Currently unused.

After PROTO LCA configuration, the above register bits are all clear.

TCRREG bit map and extra CCLK pulse

This register is write only. Before describing its use, the associated circuits are described.

A simplified circuit diagram of the PIT to PROTO LCA interconnections is shown in Fig. 1-6.

The 82C54 PIT contains three identical timer/counters; counters 0,1 and 2. The GATE0 input of counter 0 is connected to either control bit TCR4 or an external test point HWTRIG, allowing timing to be synchronized by software or some external hardware. The clock input of counter 0 is of frequency 8 MHz. This allows counter 0 to produce periodic time intervals between 125 ns and 8.2 ms in 125 ns steps. The 8MHz clock also drives counter 2.

The Counter 0 OUT0 output drives the clock input of counter 1, allowing time intervals up to 537 seconds. The OUT signals of each counter drive D flip-flops inside PROTOLCA that are set by low transitions of OUT. The flip-flops ensure reliable interrupt detection by the 68000. The three flip-flop outputs TIMERQ0,1 and 3 drive interrupt logic in the PROTO LCA.

The counters are programmed in modes 4 or 5 as described in the Intel 82C54 data sheet.

68KBit	Name	Function
0	TCR0	Clears interrupt flip-flop TIMERQ0 when low. Allows 82C54 OUT0 to set the flip-flop when high.
1	TCR1	Clears interrupt flip-flop TIMERQ1 when low. Allows 82C54 OUT1 to set the flip-flop when high.
2	TCR2	Clears interrupt flip-flop TIMERQ2 when low. Allows 82C54 OUT2 to set the flip-flop when high.
3	TCR3	Selects external HWTRIG to drive GATE0 if high, otherwise selects TCR4.
4	TCR4	Used to trigger counter 0 if selected by TCR3.

The above register bits are clear after PROTO LCA initialisation.

Bit 5 of this register is used to provide additional CCLK pulses for configuring the XC4000 LCAs on A8. This needs to be done to complete the configuration of the LCAs on A8. Clearing bit 5 will take CCLK low, setting bit 5 takes CCLK high. When manipulating bits 0-4 of TCR, bit 5 should be maintained high.

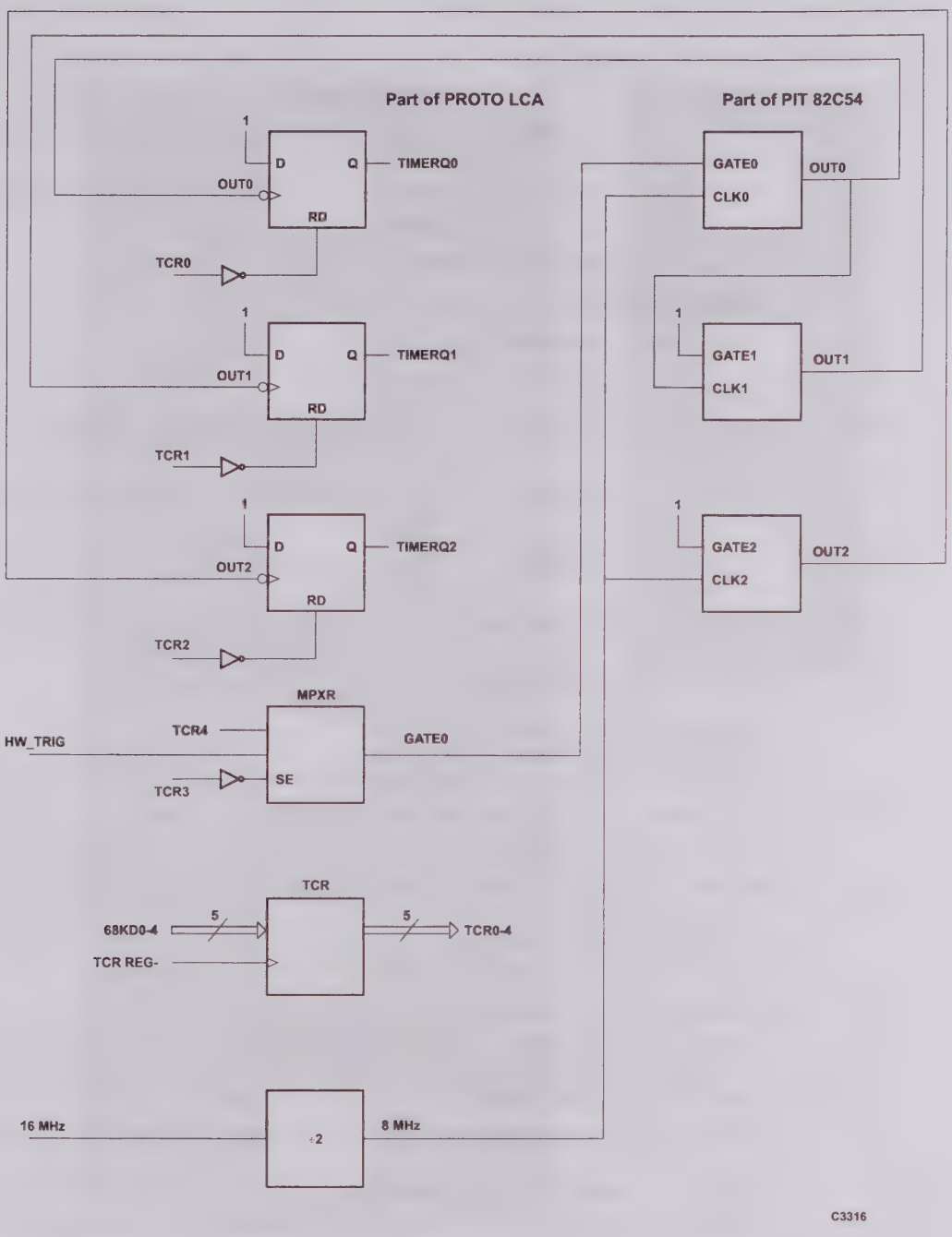

Fig. 1-6 Block diagram of PIT to PROTO LCA interconnections

PROTOCLK bit map

This register is write only.

68KBit	Name	Function
0	PROTORES(L)	Clearing this bit pulls the RESET inputs of all LCAs in the PROTO LCA configuration chain low. Setting this bit allows the LCA RESET pins to be pulled high by means of a pull-up resistor.
1	PROTODNP	Clearing this bit pulls the DNP inputs of all LCAs in the PROTO LCA configuration chain low. Setting this bit allows the LCA DNP pins to be pulled high by means of a pull-up resistor.

68000 interrupt sources

The interrupt sources are shown in the table below. The vector numbers and the provisional priority levels are shown.

Source	Enabled by	Level	Vector no (Hex)
RDP_TXRDY	RDP_TXEN	1	41
QGP_TXRDY	QGP_TXEN	1	42
IGP_TXRDY	IGP_TXEN	1	43
RTP_TXRDY	RTP_TXEN	2	44
MAP_TXRDY	MAP_TXEN	2	45
QGP_RXRDY	QGP_RXEN	2	46
IGP_RXRDY	IGP_RXEN	2	47
TTP_RXRDY	TTP_RXEN	5	48
TIMERQ1	TIMER1EN	6	49
TIMERQ0	TIMER0EN	6	4A
A6_TXRDY	A6_TXEN	2	4B
SPA_RXRDY	SPA_RXEN	3	4C
SPA_TXRDY	SPA_TXEN	2	4D
MAP_RXRDY	MAP_RXEN	3	4E
PPH_SYNC-	PPH_SYNCEN	unused	4F
TIMERQ2	TIMER2EN	6	50
A6_RXRDY(L)	A6_RXEN	3	51
RDP_RXRDY	RDP_RXEN	2	52
TTP_TXRDY	TTP_TXEN	4	53
RTP_RXRDY	RTP_RXEN	5	54

ABEL4 listing of PPH decoder

```
0001 |MODULE  PPHDEC4
0002 |title 'DSC board 68000 decoder and dtack generation
0003 |J.Welch
0004 |
0005 |Date     :- 10-Nov-94
0006 |Issue    :- 9.
0007 |'
0008 |" For A4 PM2 and PM3.
0009 to 0025 |"Comments ...
0026 |
0027 |"DSC decoder - Memory Map
0028 |"======================
0029 |"
0030 |"     Address Range    Decode      Comments
0031 |"     -------------    ------
0032 |"     0000000-03ffffh  FLASH       Read only, normal use
0033 |"     000000h-03ffffh  extrom_l    External roms, extrom_en_l low
0034 |"
0035 |
0036 |"     600000h-63ffffh  RAM         RAM, ram_exp_l input high.
0037 |"     600000h-6fffffh  RAM         RAM, ram_exp_l input low.
0038 |
0039 |
0040 |"     808000h-83ffffh  FLASH write, extrom_en_l high (also readable).
0041 |"     800000h-83ffffh  FLASH write, extrom_en_l low.
0042 |
0043 |
0044 |"     e00001h-e0000dh  Bridge write decodes. Produce general bridge cs
0045 |"     which are decoded externally as below :-
0046 |"     e00001h          rdpbri         rdpbri
0047 |"     e00003h          qgpbri         qgpbri
0048 |"     e00005h          igpbri         igpbri
0049 |"     e00007h          mapbri         mapbri
0050 |"     e00009h          rtpbri         rtpbri
0051 |"     e0000Bh          ttpbri         ttpbri
0052 |"     e0000Dh          bridgeA6        Bridge to/from A6
0053 |
0054 |"     e0000fh           protoclk        drives reset and dnp flip-flops
0055 |
0056 |"     e00011h          pitctr0         (2 wait states, write address)
0057 |"     e00013h          pitctr1         (2 wait states, write address)
0058 |"     e00015h          pitctr2         (2 wait states, write address)
0059 |"     e00017h          pitconreg       (2 wait states, write address)
0060
0061 |"     e0001dh          protocs0        Via pin protolcawr - allows
0062 |" configuration of protocol LCA (2 wait states)
0063 |
0064 |"     e00021h-e00029h  PROTOLCAWR  Write decode that drives the PROTOCOL
0065 |" LCA where PROTOLCARD and A1:3 are further decoded in the PROTOCOL LCA
0066 |" as follows :-
0067 |
0068 |"     e00021h          RESCONT     Used to independently reset DSPs
0069 |"     e00023h          TXINTEN     Used to independently enable/disable
0070 |"                                   bridge tx interrupts
0071 |"     e00025h          RXINTEN     Used to independently enable/disable
0072 |"                                   bridge rx interrupts
0073 |"     e00027h          MISCINTEN   Used to independently enable/disable
0074 |"                                   miscellaneous interrupts
0075 |"     e00029h          TCRREG      Controls 82C54 GATE0 drive, can reset
0076 |"                                   timer interrupts
0077 |
0078 |
0079 |
0080 |"     e00031h-e0004Fh  STECS       Used to write to STE LCA ( 2 wait states)
0081 |
0082 |
0083 |"     f00001h-f0000dh  Bridge read decodes. Produce general bridge cs
0084 |"     which are decoded externally as below :-
0085 |"     f00001h          rdpbri         rdpbri
0086 |"     f00003h          qgpbri         qgpbri
0087 |"     f00005h          igpbri         igpbri
0088 |"     f00007h          mapbri         mapbri
0089 |"     f00009h          rtpbri         rtpbri
0090 |"     f0000Bh          ttpbri         ttpbri
0091 |"     f0000Dh          bridgeA6        Bridge to/from A6
0092 |
```

```
0093 !"     f0000fh          status1         Allows reading of LCA config
0094 !"                                      lines; rdy, init, dnp and ldc
0095 !"                                      pins.
0096 !
0097 !"     f00011h          pitctr0         (2 wait states, read address)
0098 !"     f00013h          pitctr1         (2 wait states, read address)
0099 !"     f00015h          pitctr2         (2 wait states, read address)
0100  "     f00017h          pitstatreg      (2 wait states, read address)
0101 !
0102 !
0103 !"     f00021h-f00025h  PROTOLCARD  Read decode that drives the PROTOCOL LCA where
0104 !"                                  PROTOLCARD and A1:3 are further decoded
0105 !"                                  in the PROTOCOL LCA as follows :-
0106 !"     f00021h          TXRDYREG    Bridge TX ready register
0107 !"     f00023h          RXRDYREG    Bridge RX ready register
0108 !"     f00025h          status2     Status buffer, TIMEINT and PPH_SYNC.
0109 !
0110 !"     f00031h-f0004fh  STECS       Used to read STE LCA ( 2 wait states)
0111 !
0112 !
0113 !
0114
0115     PPHDEC4 device 'e1800';
0116
0117  "inputs
0118
0119   a23,a22,a21,a20,a19,a18                pin  14,15,16,17,19,20   ;
0120   a17,a16,a15                            pin  21,22,56            ;
0121 ! a6,a5,a4,a3,a2,a1                      pin  55,54,53,51,50,49   ;
0122
0123   dec_2aaa_l                             pin  13   ;
0124
0125 !
0126
0127   ram_exp_l                              pin  12   ;
0128   " if high 256k, if low 1M.
0129
0130   extrom_en_l                            pin  11   ; " if low, external
0131   " ROM is read from in place of on-board FLASH. Provides a means of
0132   "programming new boards fitted with blank FLASH EPROMS.
0133
0134   as_l,uds_l,lds_l,rnw                   pin  57,58,59,48;
0135
0136 . fc2,fc1,fc0                           pin  47,46,45;
0137
0138   clk10m                                 pin  60;
0139
0140   autovec_l                              pin  34;
0141 ! " Driven by external resistor. If low interrupt acknowledge via VPA,
0142 !  " otherwise by intvec_l thro' to protolca.
0143 !
0144 .
0145 ! dscres_l                               pin  36;
0146 !
0147 ! d1                                     pin 39 ;
0148 !
0149 !
0150 !
0151 !
0152 ! d0                                     pin  40;
0153
0154
0155
0156 !"decode outputs
0157 .
0158   romlcs_l              pin  2 ;
0159   romucs_l              pin  3 ;
0160 . romoe_l               pin  4 ;
0161 ! extromcs_l            pin  5 ;
0162 . raml_l                pin  6 ;
0163 . ramu_l                pin  7 ;
0164 . bridge_l              pin  68 ;
0165 . a8en_l                pin  67;
0166 ! " active when A8 bridges or ste is accessed
0167 !
0168 ! protolcard_l          pin  65 ;
0169 ! protolcawr_l          pin  64 ;
0170 ! stecs_l               pin  63 ;
0171 ! pitcs_l               pin  62 ;
0172 ! pitrd_l               pin  61 ;
```

```
0173 | pitwr_l              pin  66 ;
0174 | status1_l            pin  8 ;
0175 |
0176 | protoclk_l           pin 10 ;
0177 |
0178 |"other outputs
0179 | protodnp               pin  41;
0180 |   protoresq            pin  43         istype 'reg' ;
0181 |   " flip-flop controlling protocol LCA reset
0182 |
0183 |   protores_l           pin  37         istype 'com' ;
0184 |   " open drain buffer for above flip-flop
0185 |
0186 |   vpa_l                pin  27;
0187 |   dtacka_l             pin  23 ;
0188 |   dtackb_l             pin  24 ;
0189 |   dtackc_l             pin  25 ;
0190 |   dtackd_l             pin  26 ;
0191 |   intvec_l             pin  30;
0192 |   pdnpoe               pin  42         istype 'reg' ;
0193 |   res68k_l             pin  44         ;
0194 |   halt68k_l            pin  38 ;
0195 |
0196 |   wa                 pin  28         istype 'reg' ;
0197 |   " part of wait state logic
0198 |
0199 |   wb                 pin  29         istype 'reg' ;
0200 |   " part of wait state logic
0201 |
0202 |   berr_l               pin  32         istype 'reg';
0203 |   berr_q1              pin  33         istype 'reg';
0204 |
0205 |
0206 |declarations
0207 |
0208 | h,l,x,c,z,d    = 1,0,.X.,.C.,.Z.,.D.;
0209 | true = 1;
0210 |
0211 | address = [a23,a22,a21,a20,  a19,a18,a17,a16, a15,x,x,x, x,x,x,x,
0212 | x,a6,a5,a4,  a3,a2,a1,x];
0213 |
0214 |
0215 | romoe1_add = ((address >= ^h000000) & (address <= ^h03ffff)) & extrom_en_l ;
0216 | " FLASH o/p enable signals, normal use, 256k size
0217 |
0218 |
0219 | romoe2_add = ((address >= ^h800000) & (address <= ^h83ffff))
0220 | & !extrom_en_l ;
0221 | " FLASH o/p enable signals, 256k size, used to verify FLASH against
0222 | "external EPROM
0223 |
0224 |
0225 |
0226 |
0227 | romcs1_ro = ((address >= ^h000000) & (address <= ^h03ffff))
0228 | & extrom_en_l & rnw ;
0229 | " forms part of FLASH CS, normal use, allows reads of 256k FLASH
0230 |
0231 | romcs1_rw  = ((address >= ^h808000) & (address <= ^h83ffff)) ;
0232 | " forms part of FLASH CS, normal use, allows writes to 256k FLASH
0233 | "apart from boot sector area
0234 |
0235 | rom_2aaa_w = ((address == ^h805554) & (address == ^h805555)) &
0236 |  extrom_en_l & !rnw & !dec_2aaa_l ;
0237 |
0238 |
0239 | romcs_rw = ((address >= ^h800000) & (address <= ^h83ffff)) & !extrom_en_l ;
0240 | " forms part of FLASH CS, external ROM mode, allows writes and
0241 | " verifies of whole flash area (including boot sector),assumes 256k total
0242 | " size
0243 |
0244 |
0245 |
0246 |
0247 | extrom_add = ((address >= ^h000000) & (address <= ^h03ffff)) &
0248 | !extrom_en_l ;
0249 | " forms ext ROM CS, 256k size
0250 |
0251 |
0252 | ram1_add     = ((address >= ^h600000) & (address <= ^h63ffff))
```

```
0253 | & ram_exp_1 ;       " 256k range
0254 |
0255 | ram2_add     = ((address >= ^h600000) & (address <= ^h6fffff))
0256 | & !ram_exp_1 ;       " 1M range
0257 |
0258 |
0259 | bridge_w       = (address >= ^he00000) & (address <= ^he0000d) ;
0260 |
0261 | bridge_r       = (address >= ^hf00000) & (address <= ^hf0000d) ;
0262 |
0263 | protocs0     = (address =  ^he0001d) ; " LCA configuration address
0264 |
0265 | protolcadec_wr =( (address >= ^he00020) & (address <= ^he00029) ) ;
0266 | " write decodes done inside PROTOCOL LCA
0267 |
0268 | protolcawr   = protolcadec_wr # protocs0 ;
0269 |
0270 | protolcard   = (address >= ^hf00020) & (address <= ^hf00025);
0271 |
0272 | status1  = (address == ^hf0000f);
0273
0274 | protoclk_add = (address == ^he0000f);
0275
0276 | ste_w        = ((address >= ^he00030) & (address <= ^he0004f)) ;
0277   ste_r        = ((address >= ^hf00030) & (address <= ^hf0004f)) ;
0278
0279 | a8_w         = ((address >= ^he00000) & (address <= ^he00007))
0280 | # ste_w ;
0281 | a8_r         = ((address >= ^hf00000) & (address <= ^hf00007))
0282 | # ste_r ;
0283
0284 | pit_w        = (address >= ^he00010) & (address <= ^he00017) ;
0285 | pit_r        = (address >= ^hf00010) & (address <= ^hf00017) ;
0286
0287
0288
0289
0290
0291 | iack = fc0 & fc1 & fc2 ;        " Interrupt Acknowledge cycle
0292 |dtack_exists   !dtacka_1.PIN ;
0293
0294 | dtack_cycle = !as_1 & !iack ;
0295 |
0296   wait = (wa.fb # wb.fb) ;
0297   strobes_1 = uds_1 & lds_1 ;
0298
0299 |" bus error state machine assignment
0300 |berr_state = [ berr_1, berr_q1 ] ;
0301 |A          = [   1   ,    1    ] ;
0302 |B          = [   0   ,    1    ] ; " Bus error condition.
0303 |C          = [   1   ,    0    ] ;
0304 |
0305 |" unused state
0306 |D          = [   0   ,    0    ] ;
0307 |
0308 |
0309 |
0310 |
0311 |equations
0312 |
0313 |
0314 | !romoe_1 = (romoe1_add # romoe2_add ) & !as_1
0315 | & rnw ;
0316 |
0317 | !romlcs_1 = (romcs1_ro # romcs1_rw # romcs_rw # rom_2aaa_w ) & !as_1 &
0318 |  !lds_1 ;
0319 |
0320 |
0321 | !romucs_1 = (romcs1_ro # romcs1_rw # romcs_rw # rom_2aaa_w ) & !as_1 &
0322 |  !uds_1 ;
0323
0324 | !extromcs_1 =  extrom_add & !as_1 & rnw ;
0325 |
0326 | !ramu_1 = (ram1_add # ram2_add) & !as_1 & !uds_1 ;
0327 | !raml_1 = (ram1_add # ram2_add) & !as_1 & !lds_1 ;
0328 |
0329 | !bridge_1      = ((bridge_w & !rnw) # (bridge_r & rnw)) & !as_1 & !lds_1 ;
0330 |
0331 | !a8en_1      = ((a8_w & !rnw) # (a8_r & rnw)) & !as_1 & !lds_1 ;
0332 | !protolcard_1   = protolcard & !as_1 & !lds_1 & rnw ;
```

```
0333 |
0334 | !protolcawr_l   = protolcawr & !as_l & !rnw & !lds_l ;
0335 |
0336 | !status1_l     = status1 & !as_l & rnw & !lds_l ;
0337 |
0338 | !stecs_l    = ( (ste_w & !rnw) # (ste_r & rnw) ) & !as_l & !lds_l ;
0339 |
0340 | !pitcs_l     =( (pit_w & !rnw) # (pit_r & rnw) ) & !as_l & !lds_l ;
0341 | !pitrd_l     = !pitcs_l.PIN & rnw ;
0342   !pitwr_l     = !pitcs_l.PIN & !rnw ;
0343 |
0344 | !protoclk_l  =  protoclk_add & !lds_l & !as_l & !rnw  ;
0345 |
0346 | protoresq.ar = !dscres_l ;
0347 | protoresq  := !d0 ;
0348 | protoresq.clk = protoclk_l.pin ;
0349 | protores_l   = 1 ;
0350 | protores_l.oe  = protoresq.fb ;
0351 |
0352 | pdnpoe       := !d1 ;
0353 | pdnpoe.clk   = protoclk_l.pin ;
0354 | pdnpoe.ar = !dscres_l ;
0355   protodnp     = 1 ;
0356 | protodnp.oe  = pdnpoe.fb ;
0357 |
0358 |
0359 |
0360 | wa          := as_l ;
0361 | wa.clk       = clk10m ;
0362 | wb          := wa.fb ;
0363 | wb.clk       = !clk10m ;
0364 |
0365 |
0366 |
0367 |
0368 |
0369 | !dtacka_l = ((romcs1_ro # romcs_rw # extrom_add) & rnw & (!lds_l # !uds_l))
0370 |  # (ram1_add # ram2_add) & rnw & !uds_l
0371 |  # (ste_r & !wait) & !lds_l & rnw ;
0372 | dtacka_l.oe = !dtacka_l.d ;
0373 | " dtacka handles Flash and external rom reads, RAM reads and STE reads.
0374 |
0375 | !dtackb_l = ( (bridge_r # protolcard # (pit_r & !wait) # status1) &
0376 |  !lds_l & rnw )
0377 |  # (ram1_add # ram2_add) & !lds_l & rnw
0378 |  # (!intvec_l & !wait & !lds_l & rnw) ;
0379 | dtackb_l.oe = !dtackb_l.d ;
0380 | " dtackb handles lower byte peripheral reads ( except STE ) and upper and
0381 | " lower byte ram reads and interrupt vectoring dtack.
0382 |
0383 | !dtackc_l = (rom_2aaa_w # romcs1_rw # romcs_rw # ram1_add #
0384 | ram2_add) & !as_l & !rnw ;
0385 | dtackc_l.oe = !dtackc_l.d ;
0386 | " dtackc handles upper and lower writes to ram and rom.
0387 |
0388 | !dtackd_l = (bridge_w # protolcadec_wr # ((protocs0 # pit_w) & !wait)
0389 |  # (ste_w & !wait) # protoclk_add) & !as_l & !rnw ;
0390 | dtackd_l.oe = !dtackd_l.d ;
0391 | " dtackd handles lower byte peripheral writes.
0392 |
0393 |
0394 |   !vpa_l        = fc0 & fc1 & fc2 & !as_l & !autovec_l ;
0395 |   !intvec_l     = fc0 & fc1 & fc2 & !as_l & autovec_l ;
0396 |
0397 |   res68k_l     = 1 ;
0398 |   res68k_l.oe  = !dscres_l ;
0399 |
0400 |   halt68k_l    = 1 ;
0401 |   halt68k_l.oe = !dscres_l ;
0402 |
0403 |
0404 |" berr state machine equations etc.
0405 |berr_l.c  = !clk10m ;
0406 |berr_q1.c  = !clk10m ;
0407 |
0408 |state_diagram berr_state
0409 | state A: if ( !wait & dtack_exists & dtack_cycle ) then C ; "valid access
0410 |          if ( !wait & !dtack_exists & dtack_cycle ) then B ;"invalid access
0411 |
0412 |          if !( ( !wait & dtack_exists & dtack_cycle ) #
```

```
0413 |              ( !wait & !dtack_exists & dtack_cycle ) ) then A ;
0414 |
0415 | state B:
0416 |           if ( !dtack_cycle ) then A ;
0417 |           if ( dtack_cycle  ) then B ;
0418 |
0419 | state C: if ( wait ) then A ;
0420 |          if ( !strobes_l & !rnw & !dtack_exists ) then B ;
0421 |          if !( ( wait ) # ( !strobes_l & !rnw & !dtack_exists ) ) then C ;
0422 |
0423 | state D: goto A ;
0424 |" attempt to reduce no. product terms
0425
0426
```

0427 to 0797 |test_vectors (details not included)

```
0800
0801 |end
```

A5 Display board

Circuit diagrams: Fig. 7-65 to 7-71

Introduction

A simpified block diagram of the A5 board is shown in Fig. 1-7.

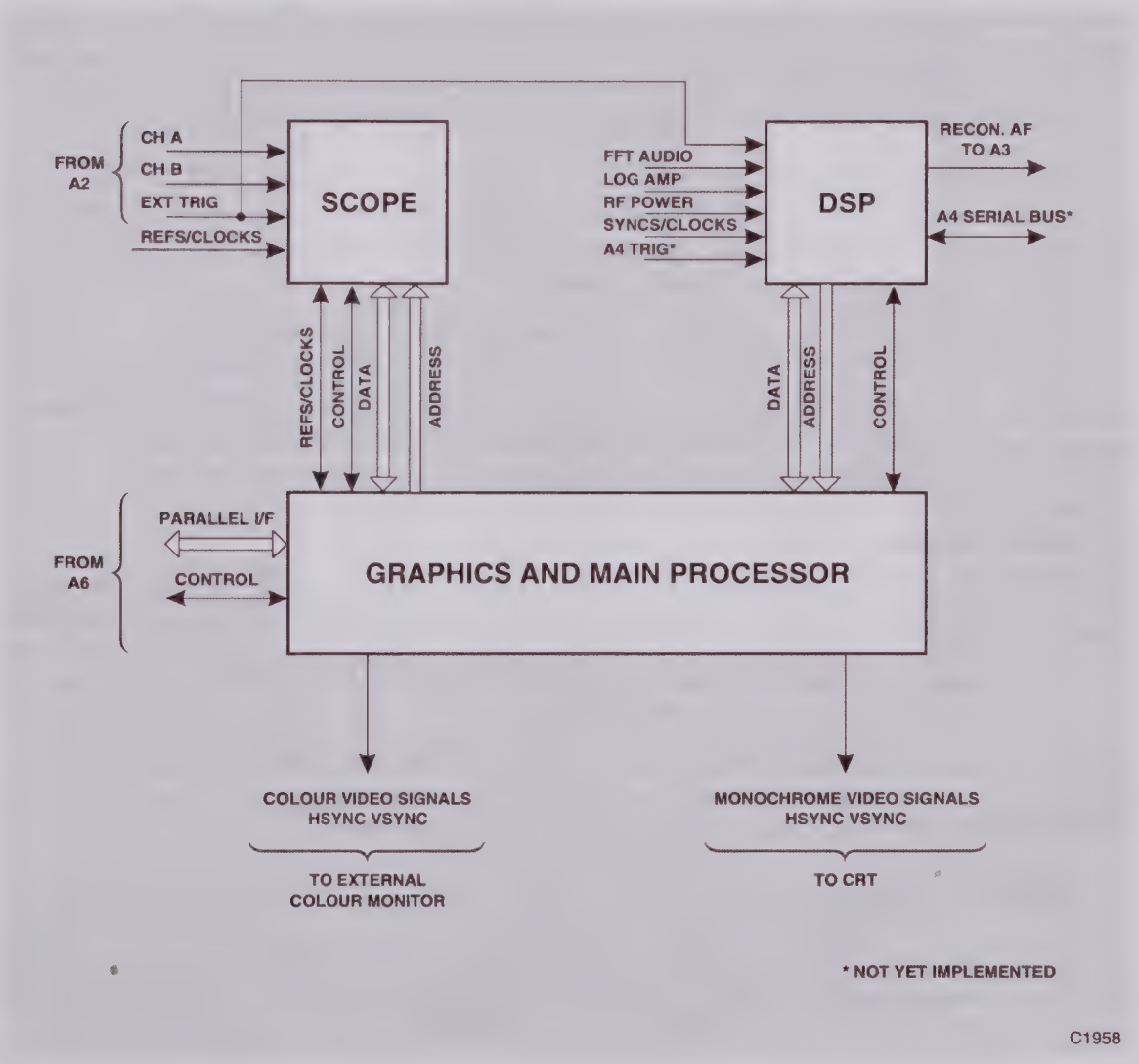

Fig. 1-7 A5 board - block diagram

The block diagram shows three main areas:-

- Graphics and main processor.
- DSP
- Scope

Graphics and main processor section

This section communicates with the A6 CPU board via an 8-bit bidirectional parallel interface. Its purpose is to acquire data from either the scope section or the DSP section. The acquired data is processed by the resident software and the resulting display data is output to the monochrome CRT and to an analog VGA connector for an external colour monitor.

The circuitry for this section is shown on sheets 1 and 2 of the circuit diagram.

DSP section

The function of the DSP section is to process one of three inputs: FFT AUDIO, LOGAMP or PWROUT. A 12-bit ADC digitizes the input at a sample rate of 102.4 kHz. Capture can be triggered by EXTTRIG or (as yet unimplemented) A4TRIG, and synchronized to various SYNC signals (see page 1-58). For each of the inputs, the DSP is configured in a different way.

When the FFT AUDIO signal is being processed, the DSP is configured as an FFT analyzer.

LOGAMP is the output of the logarithmic amplifier in the receiver section of the RF tray. When this signal is being processed, the RFSYNC line is used to synchronize RF tray signal steps with data samples that have to be processed prior to scaling, calibration and positioning on the display. Each time the RFSYNC signal goes low, the DSP section takes a sample.

Signal PWROUT represents the power present on the broad-band power sensor on AB2.

The selected signal, after processing, is transmitted to the graphics and main processor section.

Digital to analog circuits are included in the DSP section. The outputs of these include a reconstructed AF signal to the A3 board.

An A4 serial bus is provided for future expansion. This will be the means of communication with the A4 board, when it is fitted. The A4 board will process digital modulation.

The DSP section is RAM based, this memory being reloaded from an EPROM in the graphics and main processor section whenever the mode of operation is changed.

The circuitry for this section is shown on sheets 4 and 5 of the circuit diagram.

Scope section

There are two main inputs to this section: CHA and CHB. Triggering can be internal or by means of EXTTRIG. After scaling, digitized trace data appears on the data bus for reading by the graphics and main processor. The scope section is configured by the graphics and main processor section for trigger level, timebase, channel, etc., by means of the data bus and the various decode and address lines linking the two sections.

The circuitry for this section is shown on sheet 3 of the circuit diagram.

Circuit description

Graphics (sheet 1)

IC7 is the graphics processor and is configured as a 16-bit asynchronous slave interface, driven from the main processor circuits on sheet 2. Graphics data bus GD0-15 is the communication highway between the graphics processor and the microprocessor IC13 on sheet 2. The bus also provides the data path to and from the video DRAMs IC8 to IC11. Overall control of communications between processors IC7 and IC13 is exerted by Field Programmable Gate Arrays (FPGAs) IC15 and IC16 on sheet 2.

There are two clock inputs to IC7, one of 25 MHz to pin VCLK and one of 20 MHz to pin CLK. These are for the display and co-processor sections of the IC respectively.

Control lines BHE(L), M/IO, A0, GWR(L) and GRD(L) from the FPGA on sheet 2 control the modes of operation of IC7. The first three signals are associated with the setting of the asynchronous slave mode, the other two being write/read controls. Signal SEN (slave enable) is asserted by IC7 when the graphics processor is executing a transfer to or from the main processor, ensuring IC13 waits for the cycle to complete before continuing. It also provides a ready indication to the main processor..

IC3 and IC4 are palette RAMs associated with the external colour monitor and monochrome CRT respectively. They are driven with graphics data from IC7 by signals VD0-5, HSYN/WS0 and HSYN/WS1 and programmed by data downloaded from the main processor via data buses 68KD0-7 and 68KD8-15. Each RAM contains three DACs and provides three current outputs, IOB, IOR and IOG, representing the three primary colours. The IOR output from IC4 is amplified by IC5 to produce the 1 V peak-to-peak VIDEO signal required by the monochrome CRT. IC1 generates the horizontal and vertical sync pulses for the colour monitor and CRT, derived from the signals on IC7 HSYNC, VSYNC and BLANK pins. BLANK is also inverted and applied to both palette RAMs so that their outputs are all at the blanking level during inactive video time periods.

Main processor (sheet 2)

IC13 is a 68000 microprocessor which, together with the other components on this sheet, serves as the main processor in the graphics and main processor section described previously. It uses a 10 MHz clock derived from the 80 MHz board input by IC21, which also supplies 20 MHz and 40 MHz clocks to other parts of the board. IC12 buffers the lower order bits of the data bus. RAM is provided by IC14/19 and ROM by IC17/20.

FPGA IC15 handles communications between the 68000 main processor IC13 and the DSP section on sheet 4, the A6 board CPU, and the graphics processor IC7 on sheet 1. It also generates the necessary interrupts for achieving those tasks. Communications between IC13 and IC7 require that IC13 inserts wait states in its clock cycles until IC7 is ready. This is achieved by signals UDS(L) and LDS(L) from IC13, the 10 MHz clock, and SEN from IC7 which cause FPGA IC15 to produce the data transfer acknowledge signal DTACK(L) for the graphics processor.

FPGA IC16 performs graphics reset and initialization, interrupt encoding, address and function decoding for IC13, and clock generation. Signals A0, M/IO and BHE(L) are controlled by a state machine within the chip, and set up the graphics processor in the 16-bit asynchronous mode. BMS(L) from the DSP section enables ROMs IC17 and IC20 during the DSP boot sequence. Signals GINT, FFTINT(L) and A6INT(L) produce an interrupt level on the IPL0-2(L) lines. IC13 address lines A1-3 and A20-23 are decoded, producing a memory map for the processor, enabled by UDS(L), LDS(L) and AS(L). Function codes FC0-2 produce just DTACK(L), or VPA(L) and DTACK(L), in the latter case causing IC13 to generate an interrupt vector number according to the requested interrupt level.

Scope section (sheet 3)

This section is based on FPGA IC26 whose functionality is downloaded from ROM IC27 which also provides the data for the other FPGAs. IC26 is controlled from IC13 via data bus 68KD0-7 and address bus A1-3, and by means of signals SCOPE(L) and LDS(L). It provides selection facilities for graticule size, trigger functions and channel selection. A 40 MHz (normal use) or 39 MHz (for future use) clock is selected by the 39/40L signal from the A6 board CPU,

Two channels are supported, the CHA and CHB signals originating from the SC A and SC B signals from the A3 board and being fed via the A2 board. The FPGA switches IC22 to select either CHA or CHB for analog-to-digital conversion by IC24. IC25 latches the 8-bit wide digital signal to the AD0-7 port of the FPGA.

To support the FPGAs processing, IC28 and IC30 provide first-in/first-out (FIFO) memory used by the FPGA to store minimum and maximum values over each ordinate interval obtained by successive signal sampling. The minimum and maximum values are interfaced to the 68000 processor data bus by IC29 (low-order) and IC31 (high-order). To control the signal sampling and processing intervals, the FPGA uses the programmable timer IC33.

As the graphics processor IC7 requires a 25 MHz clock, a phase-locked-loop PLL is provided. This PLL comprises 50 MHz VCO TR1, loop filter IC32, and dividers and phase detector programmed within the FPGA. The FPGA then outputs the HIGHER and LOWER signals to control the VCO frequency via IC32.

DSP section (sheets 4 and 5)

The circuitry on sheet 4 centres on processor IC42 which performs the required digital signal processing. Sheet 5 shows the DAC circuits.

IC42 processes data from ADC IC39 which communicates results with processor IC13 via FPGA IC15 on sheet 2. This processing includes notch filtering, Fast Fourier Transform (FFT) and spectrum analysis, etc. IC39 can be supplied from various signal sources, from this sheet, selected by IC37, or from input selector IC34 (FFT AUDIO or LOG AMP).

IC35(a) and IC35(b) function as an anti-alias filter prior to 40 kHz low-pass filtering by switched capacitor filter IC36. IC38 filters any 4 MHz clock ripple introduced by IC36.

ICs 44-46 enable a boot sequence to occur at powerup/reset, which loads IC42 memory from ROM IC17 on sheet 2. Extra RAM for IC42 is provided by ICs 40-41.

FPGA IC43 contains the random logic needed for interfacing, clock division, etc. All ICs under its control are addressed via the FFTA8-14 lines. Among the clocks that it generates are one at 2.5 MHz that drives a successive approximation register in IC39, and one at 102.4 kHz which sets the conversion rate of IC39.

IC47 on sheet 5 is a 12-bit DAC used for offset correction of the RF power signal. The offset correction is written to it via its digital interface FFTD4-15. IC49(a) and (B) form a 1 Hz low-pass filter for the RFPOWER input. The offset correction is subtracted from RFPOWER at IC49(a).

IC53 on sheet 5 is a 12-bit DAC fed via latches IC51-52. Its output is fed to the A3 board via reconstruction filter IC54(b) and IC57(a)/(b).

IC50 provides a +5 V reference for the offset and audio DACs, and also to set the mean level of the PWROUT signal.

A5 reset and boot sequence

A buffered reset signal RESET(L) is generated by IC2(f) and IC18(a) on sheet 2 from the SYSRES_L signal from A6 main processor board. It initiates the loading of data to the FPGAs, loading of boot code to DSP IC42 and resetting of the 68000 processor IC13. The signal from A6 may be driven low at any time by its 68000 procesor to initiate A5 into a known state.

The sequence of events following a reset pulse is described below.

RESET(L) goes low

All four FPGAs held in reset state with all user I/O pins tri-state.

68000, IC13 held in reset state by DISPRES(L) from FPGA IC26.

Graphics processor, IC7 held in reset state by R12 pulling FPGA IC16 output GRESET high.

DSP, IC42 held in reset state by RES21201(L) from FPGA IC43.

Download serial ROM, IC27 address counters reset to zero by RESET(L).

Done/not programmed D/NP signal on TP4 is pulled low by IC18(c).

RESET(L) goes high

All three FPGAs enter configuration mode, continuing to hold D/NP low.

FPGA IC26 generates clock pulses CCLK incrementing the counters in the serial ROM IC27, which outputs configuration data to IC26 as DIN.

Once IC26 is filled, data is passed through it to FPGA IC15 which is then configured followed by IC16 and finally IC43.

When configuration is complete, the D/NP signal is released by the FPGAs but will not go high until all four FPGAs are correctly configured.

On completion of configuration, the LDC (low during configuration) output on FPGA IC43 goes high. As this line drives RES2101(L) the DSP is then allowed to enter its boot process.

During this boot process, the DSP reads program data from PROM IC17 on sheet 2. To do this, address information is passed through buffers IC44, 45 and IC46(a) to the PROM, which remains enabled whilst the DISPRES(L) signal is still low. The BMS(L) signal from DSP IC42 is used to indicate to the decoder in IC16 (sheet2) that the data output from the PROM is to be enabled via select line ROM(L). Once the boot sequence is complete, the DSP sets BMS(L) high and runs the program loaded from IC17.

Once the DSP is running, it sets the DISPRES(L) signal high, which releases the 68000 processor IC13 from its reset state. IC13 then runs the program contained in PROMs IC17, and IC20 releases the graphics processor IC7 from its reset state by setting GRESET low.

A6 CPU board

Circuit diagrams: Fig. 7-74 to 7-78

This board contains the main 68000 CPU IC1 (sheet 1), together with associated memory, decoding and port interfacing. As this board uses a standard type of microprocessor architecture, the following description summarizes the operation of the various circuit components.

Functions on A6 CPU board include:-

- Central processing for the test set.
- Calibration data storage in EEPROM.
- Short term non-volatile data storage in NOVRAM.
- GPIB interface port.
- Serial (RS-232) interface port.
- Parallel printer port.
- Real-time clock.
- IF counter.
- A6 to A5 display board 8-bit parallel 'bridge' interface.
- I^2C serial bus interface for control of RF tray, audio circuits and keyboard interface A7.

Clock generation (sheet 1)

The 40 MHz clock from A5 is connected to PLC from where it is fed to the amplifier circuit formed by IC57(c) and resistors R70, R71. The CMOS logic level from IC57(c) is fed via R72 to the clock generation circuits. R72 helps to reduce ringing on the clock tracks.

IC67, IC57(d), IC69(a), IC68(a) and IC68(b) form a ÷13 circuit which generates a 3.077 MHz clock that is used by IC26 (sheet 3), which controls PC-compatible serial and parallel ports.

Three ÷2 circuits, IC69(b), IC70(a), and IC70(b), provide three clocks:-

20 MHz for the A7 board
10 MHz for the I^2C bus interface IC30 (sheet 3) and processor IC1
5 MHz for the GPIB interface IC22 (sheet 4)

The remaining clock dividers provide 50 kHz for the IF counter VCO phase detector (sheet 5) and 125 kHz for power supply synchronization via PLG.

Reset generation (sheet 1)

Signal RESIN(L) on PLR is a manual system reset. IC73 detects when it is activated (low), and also if the +5 V level falls below 4.75 V. In either case, this asserts:-

- RES and HALT to IC1 (both active low).
- I^2CRES(L) to I^2C bus interface IC30 (sheet 3).
- SYSRES(L) to A6 board circuits together with A1, A5 and A7 boards.

Processor (sheet 1)

Processing on the A6 board is provided by the Motorola 68000 IC1, running at 10 MHz. This is a 16-bit microprocessor with an addressing range of 16 Mbytes.

IC2 and IC3 are bidirectional buffers, directional control being exercised by the processor RD/W(L) line, which when low outputs data onto the main data bus lines D0 to D15.

Interrupt handling (sheet 1)

EPLD IC60 (sheet 1) is formatted as an interrupt encoder which assigns programmed priorities on the various device/port interrupt signals and translates them to the CPU interrupt priorities IPL0, IPL1 and IPL2. The CPU can enable/disable various interrupt handling operations via the data bus and the signals ENACCINT (accessory socket) and ENFPINT (A7 board). The CPU can also read the status of all interrupt lines via buffers IC61 and IC62 (sheet 1) and the data bus. Interrupt line read operation is enabled by the decoded address line INTSTA(L)from IC63. On receipt of an IPLn prioritized interrupt, the CPU can read and mask the interrupts to access the appropriate interrupt routines. The significance of each interrupt line is:-

DO	SP INT(L)	Spare interrupt line.
D1	BR INT	Bridge interrupt.
D2	ACC INT(L)	Accessory interface interrupt.
D3	CTR INT(L)	IF counter interrupt.
D4	FP INT	A2 board microcontroller interrupt.
D5	GPIB INT	GPIB port interrupt.
D6	I^2C INT(L)	I^2C bus interrupt
D7	OVTEMP(L)	Over temperature interrupt from PSU.
D8	PAR INT	Parallel port interrupt.
D9	POWDWN(L)	Power down interrupt from PSU via AR1 board.
D10	RF OV	RF overload.
D11	SER INT0	Serial port interrupt.
D12	SER INT1	Test connector interrupt.
D11	VRTX INT	Real-time clock interrupt.

Address decoding (sheet 1)

Address decoding for the memory and peripheral ICs on A6 is provided by EPLD IC63. Processor address lines A15-23 and control lines RD/W(L), AS(L), UDS(L), LDS(L) are used to enable the appropriate output required.

The DTACK1 and DTACK2 outputs from IC63 provide the data transfer acknowledge signal DTACK(L) when combined by open collector buffers IC64(b) and IC64(c). For some of the decoder outputs, wait states are inserted by logic inside IC63.

Memory (sheet 2)

All of the memory requirements for A6 are contained in the circuit on sheet 2. These are as listed below:-

- EPROM. Up to three pairs of EPROM ICs may be fitted to IC10 to IC15 sockets for storage of program data. Odd numbered ICs are used for low byte information with data read on D0-7. Even numbers are high byte read on D8-15.
- NOVRAM. Non-volatile RAM is provided for short term data storage by IC8 and IC9. These contain internal Lithium batteries.
- RAM. Temporary data storage is in RAMs IC4 and IC5.
- EEPROM. IC17 and IC18 are used for the long term storage of calibration data. The EEPROMs are protected against inadvertent writes during power up or down by analog switch IC16, which disconnects the write and chip enables from their source when SYSRES(L) is active.
- Flash. Programming voltage switching is accomplished using IC21(a) and TR1-3.

Bridge circuit (sheet 3)

IC36 and IC31 (sheet 3) comprise a communication bridge. This permits communication between the processor IC1 and other processors/microcontrollers via the low-order bits (D0 to D7) of the data bus.

Currently, communication is provided to the A5 board by latching data in/out via IC31. Control is exercised by the programmed EPLD IC36.

The direction and source/destination of a data transfer can be found by looking at the appropriate IC36 signal name. For example, A6TXA5(L) indicates that A6 is transmitting data to A5. Bridge status is shown by the lines RDYA6*xxx*, where *xxx* is TX5, RX5, which show when A6 can transfer data and in which direction.

Real-time clock (sheet 3)

IC44 provides both a real-time clock facility and a periodic interrupt every 7.8 milliseconds. As IC44 has a combined address and data bus it is driven by processor IC1 in a 6800 peripheral mode. When AS(L) and VMA(L) from IC1 are low and high respectively, addressing information is passed to IC44 via buffer IC43. When AS(L) has gone high and VMA(L) low, a short time later ENABLE becomes high enabling data transfer through bidirectional buffer IC42.

The IC44 module contains the RTC IC, a timing crystal and a Lithium battery.

I^2C interface (sheet 3)

IC30 provides a serial communication interface, using the Philips I^2C protocol, between processor IC1, A boards and AE1 board. Bi-directional data and clock lines SDA and SCL are able to transfer data to and from A6 at rates up to 100 kbits per second. For a complete explanation of the I^2C serial bus, please refer to the appropriate Philips documentation.

Serial/parallel ports (sheet 3)

IC26 provides two asynchronous serial RS232 (VT10/VT21) interfaces to the rear panel serial port and the test connector, as well as a parallel (printer) interface. The two rear panel ports are compatible with current PC technology. The interface IC handles modem control signals (CTS, DSR, RLSD and RI), interrupt enables, baud rate programming and parallel port control signals.

ICs 27-29 provide the interfacing between rear panel serial lines and IC26. Decode lines for the serial ports are SER0(L) and SER1(L), and interrupt lines are SER INT 0 and SER INT 1.

The parallel port in IC26 conforms to the requirements of a Centronix type printer. The decode line for the parallel port is PAR(L) and the interrupt line PAR INT.

Step attenuator drivers (sheet 4)

The step attenuators used in the signal generator and receiver of the test set use coils to switch an attenuation stage in or out. A separate coil is used for in and out, each requiring 0.5 A pulses for a minimum of 20 ms.

IC54 and 55 are 8-bit wide latches with their inputs tied to the 68000 data bus. To change an attenuator setting, a high must be written to the appropriate bit. As ATT(L) becomes true, monostable IC56(a) is triggered at the negative going edge. The Q output on pin 13 becomes high, removing the clear input from the two latches. Data is latched into IC48 and 49 on the positive going edge of ATT(L) and appears on the output pins. After approxiametely 27 ms the monostable clears, thus clearing the outputs of the latches.

Transistors TR4 to TR17 provide high current grounding of the coils as the latch outputs go high. As the other end of the coils are connected to +5 V, each coil can be driven as required. It is important that no more than one coil is energized at one time, otherwise the +5 V rail would be pulled low due to the excessive load. In addition, a delay of around 20 ms should be allowed before driving the next coil.

External reference status circuit (sheet 4)

The status of the external reference selection circuits on the AR1 board can read onto the data bus via buffer IC66, enabled by ODD IN(L) from decoder EPLD IC63 (sheet 1).

Control port (sheet 4)

ODD SIG(L) from decoder IC63 (sheet 1) latches IC65 with information from the data bus, used as follows:

- ENACCINT, ENFPINT and ENSPINT are used to enable accessory socket interrupts, A7 front panel interface board interrupts and a spare interrupt, respectively.
- RX PREAMP(L) signal causes the pre-amplifier to be switched into the signal path on the AE3 board.
- EXT REF causes the AR1 board OCXO frequency to lock on to the incoming signal from the EXT REF socket on the rear panel.
- REF OUT either connects the AR1 board 10 MHz output to the rear panel EXT REF socket, or connects an incoming external reference to the AR1 board.

GPIB interface (sheet 4)

IC22 is a microcontroller providing a bidirectional IEE488 interface. It works in conjunction with transceiver ICs IC23 and IC24.

IF counter (sheet 5)

The IF COUNT input from AE6 board in the RF tray is fed via IC47 which is a high speed comparator performing a level shifting function. IC47 output feeds 8-bit counter/latch IC48.

Gating for the counter is achieved by means of a noise shaping synchronizer. This comprises a simple digital synchronizer IC50(a) and (b), a phase sensitive detector with two integrators, and a voltage-controlled oscillator VCO.

IC51 contains the phase detector and VCO. The phase detector has two inputs, a 50 kHz reference and the signal from the digital synchronizer (COMP IN). The output from the phase detector on pin 13 is fed to the integrators formed by the two halves of IC52. C174 is used to reduce any high impedance pick-up on the phase detector output when it is in its high impedance state. R51-52 bias the integrators to the centre of the VCO tuning range. As this range is only 0 to 5 V, D2 is used to limit the voltage swing from IC52(b).

The VCO in IC51 has its frequency limits set by C17 and R48-49. Pin 4 output is fed to the digital synchronizer.

So that the 68000 processor does not have to collect each of the 1000 required counts as they happen, a FIFO memory IC49 is used to temporarily store the data. FIFO operation is controlled from IC63 (sheet 1), CTR GO(L) initiating loading of the FIFO. On completion of data storage CTRINT(L) is asserted to indicate that counting is finished and data may be read using CTR RD(L).

Accessory interface (sheet 5)

Expander IC IC58 is I^2C controlled, and provides four logic control lines and three status lines to the rear panel accessory plug. R60 resistor pack provides extra pull-up capability for these output lines, as they are only capable of supplying 100 µA. Any change in state of the lines can be detected by enabling the accessory interrupt, as described previously in the Interrupt handling section.

The I^2C signal can be made available on PLE by enabling switch IC59. This is accomplished by setting bit 7 of IC58 high.

A7 interface (sheet 5)

SKN is the interface to the A7 board. Outgoing services include a buffered 20 MHz clock, power supplies for A7, AA1 and AB2, I^2C drive to A7 and AA1, and the system reset line. Incoming signals are an interrupt line from the A7 board processor and an RF overload line from AA1 which is routed via A7.

A6/2 CPU board

Circuit diagrams: Fig. 7-81 to 7-87

Overview

A6/2 is the second version of the A6 board. It provides the central processing core for the test set, handling MMI, data storage, I/O tasks and the IF counter.

The following facilities are provided by A6/2.

- Max. 4 Mbytes of program memory, expandable to 8 Mbytes using a daughter board.
- 128K of EEPROM non-volatile data storage.
- Max. 512K battery backed non-volatile data storage.
- Max. 1 Mbyte volatile random access memory.
- Bridge communications to A4 digital systems and A5 display processing.
- I^2C serial communications to the RF tray, front panel interface,audio generation, audio processing and accessory port.
- Personal computer style parallel port.
- Personal computer style serial (RS232) port.
- General purpose interface bus (GPIB) port.
- Digital I/O for rear panel accessory port.
- 10.7 MHz IF counter.
- Step attenuator drivers.
- Status LEDs.

Improvements over the earlier A6 board include the provision of a great deal more program and data storage memory. The program resides in Flash memory, allowing for easy field upgrade of software. A boot sector area of the program memory is loaded via a dedicated on board connector when the board is first powered up. This controls the download of the main program into the rest of the Flash memory via the parallel port.

Both the battery-backed non-volatile RAM (NOVRAM) and the Electrically Erasable PROM (EEPROM) have been increased in size to cater for the future demands of analog and digital radio testing. The NOVRAM module containing memory and battery is no longer used and a separate off-board battery is used with standard low power RAM chips. This battery also provides standby power to the real-time clock.

Many of the functions that were implemented in discrete logic have been integrated into large pin-out PLDs. These include clock generation, reset generation and the IF counter as well as the circuit areas that were already in PLDs such as address decoding, interrupt handling and bridge communications.

Throughout this description and on the circuit diagrams references are made to signals with the suffix '_L' as in WR_L. This indicates that the signal is active low.

For detailed information on any of the devices used, please refer to the manufacturer's data.

Clock generation (sheet 1)

The 40 MHz clock from A5 is connected to PLC from where it is fed to the amplifier circuit formed by IC1(d) and resistors R1, R2. The CMOS logic level clock from IC1(d) is fed via R3 to the clock dividers contained in IC2 PLD. R3 helps to reduce ringing on the clock tracks.

IC2 takes the 40 MHz clock signal and divides it down to the frequencies required elsewhere on A6/2. Three ÷2 circuits are used to give 20 MHz, 10 MHz and 5 MHz outputs.

The 3.077 MHz (actually 3.076923076923 MHz) is derived from the 40 MHz clock, using a 4-bit state machine with 13 states. This provides a clock with a mark-to-space ratio of 6:7. The outputs of the state machine are accessible on pins 5 to 8 of IC2.

A 1 MHz clock is generated for use inside the PLD by dividing the 5 MHz by 5, using a 3-bit counter with a maximum count of 4. The 1 MHz ÷5 has its outputs on pins 9 to 11.

The 1 MHz is divided by 2 three times, giving outputs at 500 kHz, 250 kHz and 125 kHz. The 125 kHz is used to provide power supply synchronization via R8 and PLG pin 15.

The 500 kHz is divided by 5 in the same manner as the 5 MHz to give 100 kHz, which is then divided by 2 to supply the 50 kHz reference required by the IF counter.

Reset (sheet 1)

IC3 provides the power up reset for the processor and the rest of the test set. An active low reset pulse is output from pin 6 for a period of 250 to 1000 ms following application of the 5 V supply. Should the supply fall below 4.62 nominal the reset output is re-asserted thus ensuring the processor is held in reset as power disappears.

The test set may also be reset by shorting together the two pins of PLR which pulls down the PBRST or push button reset input of IC3.

The output from IC3 is connected to IC2 which outputs the reset pulse on four open drain pins, RES68K, HLT68K, I2CRES and SYSRES. These pins are pulled low during the power up reset state. Pull up of these four lines is by R108 to R111 inclusive. If the processor IC5 outputs a reset on its reset pin, the SYSRES_L and I2CRES_L lines are pulled low for the duration of the processor reset.

SYSRES_L is the reset line to devices other than the processor on A6 and to processors on A1, A5 and A7. An inverted, active high, output SYSRES from pin 27 of IC3 provides the reset pulse to the GPIB control integrated circuit, IC52. The line I2CRES_L is the reset for the I^2C controller IC44. The I^2C controller is capable of driving its own reset line and so must be provided with a separate reset.

Processor and data buffers (sheet 1)

Processing on A6/2 is provided by IC5, the Motorola 68000 running at 10 MHz. This is a 16-bit microprocessor with an addressing range of 16 Mbytes.

IC6 and IC7 provide bidirectional data bus buffering. Directional control is provided by the processor read/write line WR_L, which when low outputs data onto the main data bus lines, D0 to D15.

Interrupt handling (sheet 1)

The 68000 processor is capable of responding to seven interrupt levels, each one having a greater priority than the preceding one. All levels are maskable except for the highest.

As there are thirteen interrupting devices, it is necessary to encode them into the required priority level. This is accomplished using part of PLD IC4. All thirteen interrupt lines enter IC4, where they are encoded onto the three processor interrupt lines, IPL0-2.

In addition, the status of all thirteen interrupt lines can be read by the processor at the data outputs when the INTSTA input to IC4 on pin 23 is selected.

The interrrupt acknowledge circuitry is also contained within IC4. When the processor acknowledges an interrupt, it sets the function code lines FC0-2 high, sets address lines A1-3 to the interrupt level being responded to, and asserts the address strobe line AS_L. This is detected by IC4, which then asserts the VPA output on pin 66. In the case of the interrupting device being the I^2C controller, IC44, IC4 asserts I2CACK on pin 67 instead of VPA. IC44 then provides an interrupt vector to the processor. In the cases where VPA is asserted, the processor provides its own vector.

Status LEDs (sheet 1)

Four status LEDs D1 to D4 are used to provide debug information. These are controlled by latches in PLD IC4 which are written to when the ODD_WR_L decode is driven. See the section on Odd signal in/out (page 1-69) for further details.

The following table indicates the sequence seen on the LEDs during power up as the boot diagnostic routines run. The symbol • indicates that the LED is lit.

D1	D2	D3	D4	Status
•	•	•	•	Power up - boot diagnostics started.
•	•	•		RAM test started.
•	•		•	Flash memory test started.
•	•			NOVRAM test started.
•		•	•	I/O ports test started
•		•		GPIB test started.
•			•	Real-time clock test started.
•				I^2C test started.
	•	•	•	IF counter test started.
	•	•		EEPROM test started.
				Boot diagnostics complete.

The diagnostics execute very quickly, so the LEDs will 'count' down to zero almost quicker than the eye can see, except that the RAM test takes an appreciable amount of time, so the count will appear to pause at the second step. If the LEDs stick at a particular value, then the code is having problems executing a particular diagnostic or has crashed.

Once the boot diagnostics have been completed, the LEDs follow a second sequence to indicate that the main code is running. The LEDs remain at each state for approximately 0.1 second.

The sequence is as follows:

D1	D2	D3	D4
			•
		•	•
	•	•	•
•	•	•	•
•	•	•	
•	•		
•			

The LEDs then remain unlit.

Address decoding (sheet 2)

Address decoding for the memory and peripherals on A6/2 is provided by PLDs IC8 and IC9. The BOOTUP input to pin 49 of IC8 from connector SKS pin 48, controls the switching of the mapping of the Flash memory. When this line is driven high by a memory expansion board, the Flash memory is mapped to a position starting 5 Mbytes higher. This allows the expansion board to run boot software. The decode line EXTMEM_L, on SKS pin 47, is used for any accesses to the bottom 5 Mbytes when the memory expansion is present.

Also generated by these ICs is the data transfer acknowledge signal, DTACK_L, required by the 68000 processor. The only instance where DTACK is not generated is for the I^2C controller select line as the controller generates its own. Where necessary, wait states are inserted by delaying the DTACK response. The appropriate delay is set inside the PLDs by using the outputs of the wait state generator on pins W0-2 on IC8. The DTACK outputs of IC8 and 9 are open drain and drive DTACK_L low when active. Should DTACK not be generated within 14 wait states, IC9 outputs BUSERR_L to the processor indicating an incorrect address.

Other control signals from the decoder PLDs are:-

IO_WR_L	Used by IC46 serial/parallel controller
IO_RD_L	Used by IC52 GPIB controllers
RD_L	Used by Flash and EEPROM memory devices
RTC_DS_L	Used by real-time clock IC43 and associated circuitry
RTC_AS_L	Used by real-time clock IC43 and associated circuitry
VPA_L	Used instead of the DTACK line to indicate a 6800 mode data transfer, which in this case is for the real-time clock.

Program Flash memory (sheet 2)

Flash technology

A6/2 processor programming instructions are kept in the Flash memory, IC10 to IC17. This type of memory has major advantages over the traditional EPROM. The main one is that it is erasable electrically rather than by using ultra-violet light, enabling it to be programmed whilst fitted to the board.

The intention is that up to 4 Mbytes of Flash memory may be soldered directly to A6/2 and that a further 4 Mbytes can be fitted using a memory expansion board connected to SKS, SKT and SKU. Initially, only 3 Mbytes will actually be fitted to the board. When the parts are initially fitted they will not be programmed.

To program the Flash memory, a download PCB will be used. This plugs into PLS and will contain 68000 code that will load the first 128K of Flash memory with a three boot program. When the download card is plugged in, the address range of the Flash memory is shifted up, allowing the download card to reside at the bottom addresses as required by the 68000 processor for start-up.

The rest of the test set software will be downloaded using a personal computer (PC) to download code via the parallel port. This ability to download the main section of 68000 code allows updating of software in the field.

Write protection

Although the Flash memory integrated circuits require a specific sequence of writes to initiate programming, two extra levels of write protection have been built into A6/2. The first of these prevents writes to any part of the Flash memory and the second acts as another level to protect the boot sector code.

The decoder, IC8, provides the write signal FL_WR_L to the Flash memory. Control of this line is by the processor write line, WR_L, the correct address range and the two inputs to IC8, DOWNLOAD and WR_BOOT. When the BOOTUP signal from external memory connector SKS, is set high,the Flash memory occupies its higher address range. During this time, all writes to Flash are allowed. However, under normal operation,writes to the boot section can only take place if both of the inputs, DOWNLOAD and WR_BOOT, to IC8 are set. If only DOWNLOAD is set, writes are allowed to all parts of the Flash memory except for the bottom 128 kbyte boot sector.

The DOWNLOAD and WR_BOOT signals are generated in part of PLD IC4 (sheet 1), the interrupt handler. To set DOWNLOAD, three writes must be made to the state machine in IC4. To set WR_BOOT an additional write must be made. Each write has different address and data so that a runaway processor could not set either line. Any incorrect writes will return the state machine to its idle state.

Non-volatile memory (sheets 2 and 3)

EEPROM (sheet 2)

EEPROM is provided for the storage of calibration and other sensitive data. IC18 to IC21 are 32K × 8 devices, giving a total EEPROM size of 128K. Unlike the Flash memory, these integrated circuits allow programming of individual bytes at any time. Although they require a fixed sequence of writes to enable programming, further protection is used during power up or down. The chip select lines are passed through the switches in IC22. When SYSRES_L is low during power transitions, all switches are open and resistors R35 to R38 pull the chip selects high, thus disabling any access to IC18-21. During power down, the supply to IC22 is maintained for a short length of time by D5 and storage capacitor C2. During this time, the switches remain open.

NOVRAM (sheet 3)

A futher 512K of non-volatile memory is supplied using static RAM with battery backup. The memory size is made up of 4 128K × 8 devices, IC27 to 30. Note that only 256K are to be fitted to the board initially; any extra can either be fitted to A6/2 or by use of a memory expansion board.

Power to these four chips comes via NOVRAM controllers, IC23 to 26. During normal operation, these apply the +5 V rail to the memory, but when no +5 V is present they apply the 3 V battery voltage from PLL. R39 has two purposes, firstly to protect the battery in case of shorts on the board and secondly to allow monitoring of the standby current (1 µA) by measuring the voltage between TP1 and TP2 (1 mV).

The chip selects to the memory are also passed through the NOVRAM controllers. When the +5 V rail falls below 4.5 V to 4.75 V, the controllers connect the CEO pin to either the +5 V rail or the battery, whichever has the higher voltage, thus disabling any accesses to the RAM ICs.

Random access memory (sheet 3)

IC31 to IC38 are 128K × 8 RAM chips which make up the 1 Mbyte of random access memory. IC8 provides their chip select signals, RMn_xx_L, where n is the pair number and xx is UP or LO, indicating upper or lower byte. Only 512K of RAM will be fitted initially, any expansion on this can either be fitted to A6/2 or by use of a memory expansion board.

A4/A5 bridge (sheet 4)

The bridge to A4, digital systems card and to A5, the display card, provides fast, byte wide communications between boards.

All the logic required to control the bridge is contained in IC39 PLD. IC40 is a bidirectional buffer which isolates the 68000 data bus from the bridge data and also controls the data direction. The decode signals from pins 62 to 65 of IC8 write or read data to or from the bridge. The direction and source/destination can be found by looking at the signal name. For instance, A6TXA5_L indicates that A6 is transmitting data to A5.

Status of the bridge is shown by the lines RDYA6*xxx* where *xxx* is TX5, RX5 etc.. These lines show when A6 can transfer data and in which direction. In addition, changes in status can also be made to generate processor interrupts. Enabling of these interrupts is controlled by latches in IC39, changes being made by writing appropriate data to the BRCTL_L address decode. Reading the bridge status is accomplished using the same address.

Real-time clock (sheet 4)

Real-time clock IC43 provides time and date settings together with a regular interrupt on RTCINT_L if required. Present software uses this interrupt to provide a scheduling timer every 7.8125 milli-seconds. XL1, a 32.768 kHz crystal, is the timing reference. In addition, IC43 contains 50 bytes of non-volatile battery backed memory.

As IC43 has a common address and data bus it is necessary to operate the 68000 processor in a 6800 mode during accesses. This is accomplished by using the ENABLE and VMA signals from the processor, pins 22 and 21 of IC5. The I/O decoder, IC9, does not respond to the real-time clock address by setting DTACK_L low as it does for other devices. Instead it responds with VPA_L (valid peripheral address). IC9 drives pin 36, RTC_AS, low during the 6800 address portion of the cycle. This tells buffer IC42 to place the address information on the RTC address/data pins and tells the RTC that it is there. During the data transfer part of the 6800 cycle, RTC_DS_L is asserted and data is transferred to or from the RTC by IC41, a bus transceiver. IC1(a) and (b) invert the RTC_AS_L and RTC_DS_L signal for IC43.

When normal supply power is not connected to IC43, power for the internal clocks is provided by the same battery as that used for the non-volatile RAM. If the +5 V rail is missing, IC43 automatically switches over to the battery supply. One of the RTC registers contains a flag indicating the validity of the stored data and time following a power down state. This flag is checked on power up.

Serial and parallel ports (sheet 4)

The PC compatible serial and parallel data ports are controlled by IC46. This IC, a 16C452, contains dual-channel asynchronous communication element (ACE) interfaces along with a single Centronix parallel port interface. The 16C452 provides control for modem signals, interrupt enables, baud-rate programming and parallel port control signals. The 68000 processor can read the status of the ACE interfaces at any point in the operation. The status includes the state of the modem signals (CTS, DSR, RLSD and RI) and any changes to these signals that have occurred since the last time they were read, the state of the transmitter and receiver including errors detected on receive data, and printer status.

Serial

The single serial (ACE) interface provides a serial-to-parallel conversion for data received from a peripheral device and a parallel-to-serial conversion for data transmitted by the test set.

IC45 provides the interfacing between the 5 V logic levels of IC46 and the RS-232-E compatible serial interface. Decode line SER0_L and SERINT_0 are the serial port chip select and interrupt lines respectively.

The spare serial interface has its inputs tied to +5 V by R49 to 53 to reduce noise whilst its chip select and interrupt lines are still accessible.

Parallel

The parallel interface in IC46 provides a bidirectional parallel data port that fully conforms to the requirements of a Centronix-type printer. Resistors R54 to 61 and capacitors C9 to 16 provide an RC network as used on PCs.

Chip select for the parallel port is via decode PAR_L and its interrupt line is PAR_INT.

The control LPTOE_L from IC51 to pin 1 of IC46 is used to control data direction. When this line is low, data may only be sent over the parallel bus, but when high the PD0-7 data lines become high-impedance allowing them to be used for inputs. This mode of operation is only provided for possible future use.

Step attenuator drives (sheet 5)

The step attenuators used in the signal generator and receiver of the test set use coils to switch an attenuation stage in or out. A separate coil is used for in and out. These require approximately 0.5 A pulses for a minimum of 20 milliseconds to operate.

IC48 and 49 are 8-bit wide latches with their inputs tied to the 68000 data bus. To change an attenuator setting a high must be written to the appropriate bit. As the ATTEN_L becomes true at its negative going edge, the monostable IC47(a) is triggered. The Q output on pin 13 becomes high removing the clear input from the two latches. Data is latched into IC48 and 49 on the positive going edge of ATTEN_L and appears on the output pins. After 27 milli-seconds the monostable clears thus clearing the outputs of the latches.

Transistors TR1 to 14 provide high current grounding of the coils as the latch outputs go high. As the other ends of the coils are connected to +5 V, each coil can be driven as required.

It is important that no more than one coil is energized at one time as the +5 V rail will be pulled low due to excessive load. In addition, a delay of around 20 ms is allowed before driving the next coil.

Odd signal in/out (sheet 5)

ODD signals are defined as the various input and output signals not dealt with elsewhere. Buffer IC50 allows the following AR1 board status signals to be read:-

EXT_PRES	External standard present
EXT_HI_L	External standard high in frequency
EXT_LO_L	External standard low in frequency
INT_OK	OCXO running

8-bit latch IC51 controls the following:-

Two of the interrupt enable lines via ENACINT and ENFPINT
External/40 MHz clock switching on A5 with EX/40M_L
Frequency reference in/out on AR1 with REF_OUT and EXT_REF
RF tray receiver AE3 20 dB amplifier on/off with SENSRX_L and LPTOE_L

LPTOE_L enables the parallel port to read data as well as send it.

ODD_WR_L select line controls two further interrupt enables and the four status LEDs, D1 to D4 via IC4 (sheet 1).

General purpose interface bus (sheet 5)

The GPIB is an 8-bit parallel bus designed for instrument control. On A6/2 this bus is implemented using IC52 a NEC uPD7210 or its INTEL equivalent, the 8291A.

IC53 and IC54 provide buffering and termination for the actual GPIB lines.

IF counter (sheet 6)

This counter utilizes a noise shaping synchronizer for gating. The noise shaping synchronizer comprises a simple digital synchronizer made from two D-type flip-flops, a conventional three or more state phase-sensitive detector, with two integrators and a voltage-controlled oscillator.

Level shifting of the IF signal input on PLA pin 1 is performed by high speed comparator, IC55. The logic level IF signal is then passed to PLD, IC2(b). This PLD contains the simple digital synchronizer, an 8-bit binary counter and an 8-bit latch. Pins 23 and 24 carry the synchronizer outputs PHA_DET and CTR_CLR. The PHA_DET output also drives one input of the phase detector contained inside IC57. Counter outputs are on pins 44 to 47 and 57 to 60 of IC2 and drive the inputs of the latch in IC2. The positive going edge of PHA_DET loads the data into the latch. PHA_DET and CTR_CLR are gated together and clear the counter when both are high. Thus the counter data is latched and the counter then cleared one cycle of the IF signal later.

The phase detector is contained in IC57, a 74HC4046 which combines a voltage-controlled oscillator (used for the VCO required by the counter) with two different types of phase detector (type 2 used). One input to the phase detector is the PHA_DET signal and the other the 50 kHz frequency reference from IC2 pin 28. The output from the detector on pin13 is fed to the integrators formed by the two halves of IC58 together with R95 to 98 and C29 and 30. C25 is used to reduce any high frequency pick-up on the phase detector output when in its high impedance state. R93 and 94 bias the integrators to the centre of the VCO tuning range. As this tuning range is only 0 to 5 V, D14 is used to limit the voltage swing from IC58(b).

The VCO in IC57 has its frequency limits set by C24 and R90,91, and its output on pin 4 feeds the synchronizer in IC2.

So that the 68000 processor does not have to collect each of the 1000 required counts as they happen, a first-in-first-out (FIFO) memory is used to temporarily store the data. IC56 is a 1K x 9 FIFO where eight of the inputs are connected to the latch outputs in IC2. The ninth input and output are not used. Data is transferred into the FIFO by the falling edge of FIFOWR_L from IC2. This is generated by PHA_DET gated with the END_WR signal generated in IC2. Storage of data into the FIFO is triggered by writing to the counter address. The write clears END_WR allowing FIFO writes to take place.

END_WR becomes true when either the FIFO half full flag HF or the full flag FF become true. The choice of which is used is set by the decode address used to trigger the storage of data. When the address ends in 1, the full flag is used and when it ends in 3, the half full flag is used. On completion of the data storage the counter interrupt line CTR_INT becomes true indicating to the processor that counting is finished. Data from the FIFO is read by the 68000 processor by reading from the counter address. Each consecutive byte of data is read from the same address. The first read will clear the interrupt.

Accessory interface (sheet 6)

The interface for the rear panel accessory connector digital lines is based around the I^2C bus. Outputs P0 to 3 of IC59, an I^2C to parallel interface, are used to generate the four logic control lines, LOGIC_0-3 found on PLE. The next three bits of IC59 are used to provide the status lines, STATUS_1-3, which are required for 2955 accessory compatibility. R100 resistor pack provides extra pull-up capability for the outputs from IC59 as they are only capable of supplying 100 µA. Any change of state of the accessory connector digital lines can be detected by enabling the accessory interrupt.

The I^2C signal can also be made available on PLE by enabling the switches in IC60. This is accomplished by setting bit 7 of IC59 high. This is the power up state of the IC59 outputs.

In addition, the 12 V power supplies are available, protected by resettable fuses FS1 and FS2. This type of fuse undergoes an abrupt change in resistance when an overcurrent heats it up to its trip temperature. This increase limits the current from the power supply. Once the overload is removed and the fuse cools down, it will return to its low-resistance state.

A7 interface (sheet 6)

SKN provides the interface to A7. Signals contained on SKN include a buffered, 20 MHz, clock, power supplies for A7, AA1 and AB2, I^2C drive to A7 and AA1 and the system reset line SYSRES_L.

Incoming signals are an interrupt line from A7 processor and the RF overload line, RF_OV_L, from AA1, which goes via A7.

Memory expansion (sheet 7)

Capacities for the various types of memory have been described earlier in this board description. Should any extra memory up to the decode boundaries be required for a later software update, an expansion board will need to be fitted. Connectors SKS, SKT, SKU and SKX are fitted for this purpose. These connectors provide the address decodes, address and data lines and control signals to access the memory expansion.

This expansion board would not require anything other than the memory devices and in the case of NOVRAM, non-volatile controllers. The memory expansion facility will also be used for initial download of boot sector software and RAM expansion for the processor emulators using appropriate plug in boards. These boards will pull the BOOTUP line on SKS pin 48 high, indicating their fitment and changing the memory map appropriately.

A7 Front panel interface board

Circuit diagrams: Fig. 7-89 to 7-93

Introduction

Fig. 1-8 is a simple block diagram showing the A7 board and the units to which it is connected. The board is situated at the top of the test set, directly behind the front panel. It can be fitted with a memory card for storing instrument setups, etc. The memory card plugs directly into the A7 board through a slot in the panel.

Operation of the A7 is based on a microcontroller µC, which in turn is supervised by the A6 board CPU via the I^2C bus. Note that there is also an I^2C connection to the AA1 input switch. All front panel controls, except *Power On LED* and *Intensity*, interface with the µC, which also controls multimeter and RF calibration circuits.

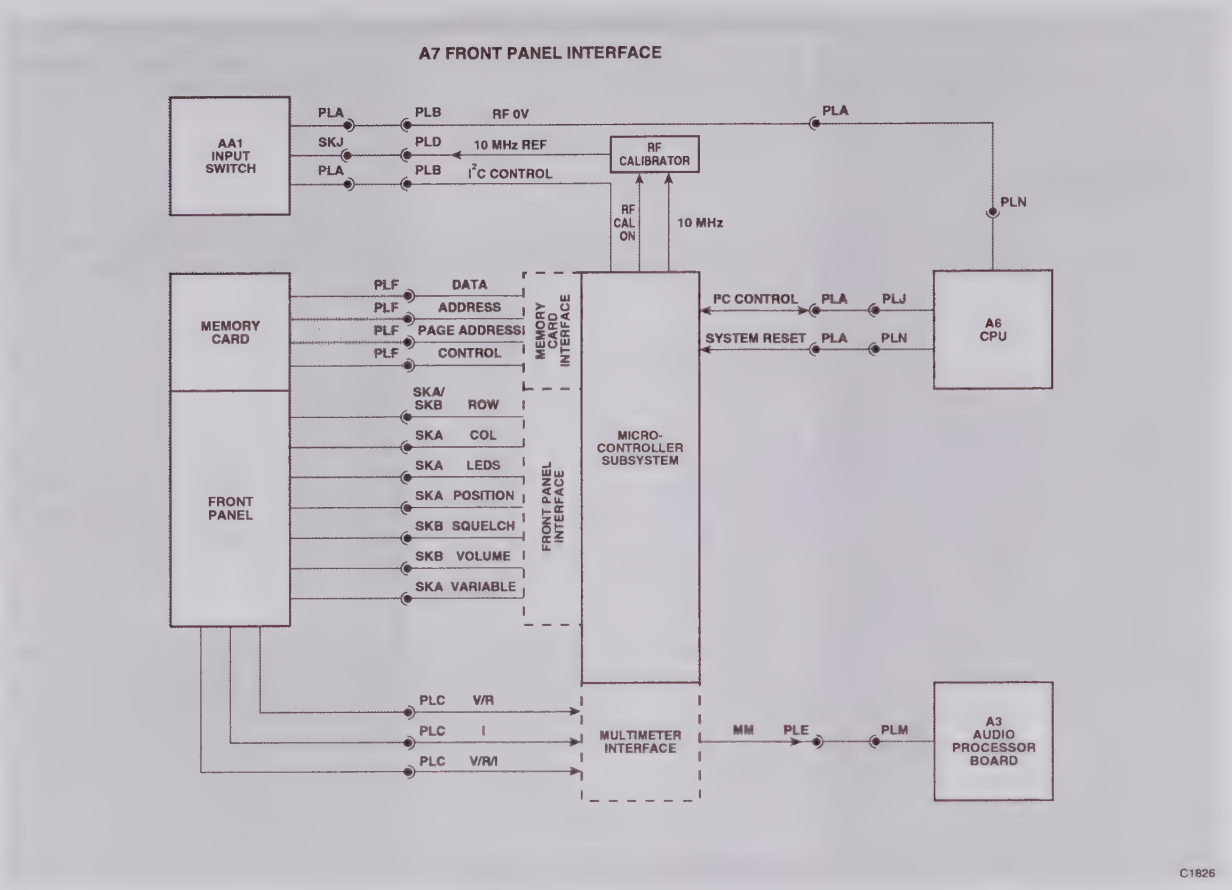

Fig. 1-8 A7 board - block diagram

Microcontroller (sheet 1)

Port services

The µC IC1 has six ports, providing the following:-

- Port 0 8-bit multiplexed address/data bus.
- Port 1 Keyboard row scanning and I²C communication to A6 and AA1.
- Port 2 8-bit high-order address bits of 16-bit wide address bus.
- Port 3 Control signals associated with the keyboard scanning, memory card read/writing, and front panel VARIABLE control handling.
- Port 4 Keyboard column scanning.
- Port 5 Handling of memory card control signals, front panel POSITION, SQUELCH and VOLUME rotary control signals, and multimeter trip condition. This port includes an ADC function.

Keyboard scanning

The front panel keys are arranged in an 8-column by 9-row matrix. Row and column signals ROWx and COLx are connected to ports 1, 3 and 4, each line being provided with a pull-up resistor. When a key is pressed, a row line is connected to a column which is detected by the microcontroller.

VARIABLE control

The front panel VARIABLE control is a rotary pulse encoder. The two signals VAR _A and VAR _B are pulsed when the VARIABLE front panel control is rotated. The phase displacement of VAR _B relative to VAR_ A indicates the direction of rotation. Movement is detected using a dedicated interrupt VARINT L. This signal is generated via inverter IC6(a). The µC, on receipt of VARINT L, strobes IC6(a) to determine the direction of rotation. The number of pulses indicates the amount of rotation, and the pulse repetition frequency indicates the rate of rotation.

SCOPE POSITION, SQUELCH and VOLUME controls

The SCOPE POSITION, SQUELCH and VOLUME controls are 0 to 5 V analog signals which are filtered (R12/C1, R13/C2 and R14/C3) before being fed to the µC's port 5. AVREF+ and AVREF- are 5 V and 0 V references for the internal ADC. Note that the INTENSITY front panel control is connected directly to the CRT module.

Address latch

The address latch IC2 demultiplexes the eight low order address lines from the µC's AD bus thus providing a 16-bit wide address on A0-15. IC4 is enabled by the µC's ALE, address latch enable, control signal.

Memory

EPROM IC4 provides 16 kbytes of program memory and IC5 8 kbytes of RAM. IC4 is enabled by the µC's PSEN_L signal. IC5 is enabled by RAM_L from the address decoder, described later. RAM read and write are controlled directly by the µC's RD_L and WR_L signals. The paged memory of the plug-in memory card is described later.

Address decoder and control latches

The µC's high order address bits A13, A14 and A15 are decoded by IC3 to provide either a RAM chip select or one of three latch signals LAT1_L, LAT2_L or LAT3_L. Each of the three latch signals places information on bus AD0-7 into a control latch. These three control latches, for the purposes of this description, are designated control latch 1, control latch 2 and control latch 3. Control latch 1 is associated with multimeter control on sheet 3, described later. Control latch 2 is associated with the plug-in memory card circuits on sheet 2, described later. Control latch 3 is on sheet 1 and is described in the next section.

It should be understood that, in each case, the strobed data on bus AD0-7 is accessed from a dedicated data location, for the particular latch, in the µC's memory space.

LED control latch

The front panel TNC and N-type socket input/output functionality (controlled by the RF SELECT key) is indicated by four light-emitting diodes LED1, LED2, LED3 and LED4. These LEDs are driven via current limiting resistors R29 to R32 by IC7, which is the control latch 3 referred to in the previous section. The LED status is determined by data written by the microcontroller. Data is latched into IC7 by write signal WR_L occurring while LAT3_ L is asserted by IC3 decoder.

IC7 also latches the following:-

- RFCAL_ON to the RF calibrator circuits on sheet 5.
- CRDATT_L signal used in the memory card interface on sheet 2.
- FP_INT (front panel interrupt), which is currently unused.

Memory card interface (sheet 2)

The memory card conforms to the JEIDA 4 standard, providing up to 8 Mbytes of paged storage capacity.

A page is selected by writing the page number to the dedicated location in the µC's memory space. The memory card is addressed in 32K pages numbered 0 to 255. To access a particular page, its address is latched into control latch 2, IC10. The page address then acts as the high order address lines for the memory card.

While a memory card is correctly inserted, contention between the EPROM and the memory card (which occupy the same physical memory space) is prevented by the µC's PSEN_L signal which enables/disables the EPROM for the appropriate EPROM read/memory card read-write operations.

Card detect signals CD1_L and CD2_L (bottom left of diagram) are used to generate the card present signal CPRES_L and the card data enable signal CDATEN L. These signals provide enabling for data/address buffers IC8 to IC12, and allow the µC to access the memory card only when the card is properly inserted thus preventing data corruption on insertion and removal.

Note that the address line A15 disables the memory card, but permits the page address to be set thus preventing the page address being changed while the memory card is being accessed.

Other card output lines are BVD1 and BVD2 (battery voltage detect) and CARD_WP (write protect). These all connect directly from the memory card socket to the µC.

Any memory card will contain some attribute memory (256 bytes or less) and some data memory. Selection between attribute and data is by CRDATT_L from control latch 3, IC7. If attribute memory has been selected, the CRDATT_L signal is asserted, producing REG_L to the memory card.

The outputs from memory card control buffer IC12 are only enabled when the card is present. Also buffered by IC12 are memory card signals CE1_L, OE_L and WE_L which are generated from µC signals A15, RD_L and WR_L respectively.

The lower half of IC12 is wired to provide an inverted system reset signal RST.

Clock buffer and dividers (sheet 3)

The 20 MHz reference signal on PLA from the A6 board is first amplified by IC6(b) before being divided by 2 in IC13. The resultant 10 MHz clocks 10MHZ_A and 10MHZ_B are used by the µC and RF calibrator respectively.

Multimeter interface

The multimeter interface on sheets 3 and 4 contains the following elements:-

- **Multimeter control** (sheet 3). Microcontroller control of multimeter functions.
- **Voltage references** (sheet 4). Used for the multimeter current source, ohms protection and RF calibrator.
- **Ohms on/off and ranging** (sheet 4). Sets the current source and its connection to the input terminals.
- **Current source** (sheet 4). Current source with selectable current used for resistance measurement.
- **Ohms protection** (sheet 4). Protects the current source against excessive input voltages.
- **V/I switch** (sheet 4). Switches differential amplifier input between voltage and current measurements.
- **CMRR CAL switch** (sheet 4). Used during current measurements to minimise the effects of common-mode input voltages.
- **Differential amplifier** (sheet 4). High impedance and voltage input differential amplifier with selectable gain.

Control latch and relay drivers (sheet 3)

Sheet 3 shows IC14, which is designated control latch 1, described previously. This latches multimeter control data from the dedicated location in memory. The outputs of the latch feed relay drivers TR1-2, TR3-4 and TR13 which operate relays on sheet 4. Latch data determines which relays operate, which in turn select one of three modes of operation, i.e. voltage, current and resistance. In each of these modes, the meter ranging is partly done on this board, and some on A3 and A2 before the signal is digitized. See the section on AF, demod and multimeter ranging for further information.

Voltage references

A precision +10 V reference is supplied by IC16 for use on A7. IC18 together with emitter follower TR12 invert this for use as a negative reference.

Ohms on/off and ranging

Relay RLB is used to connect the current source to the multimeter input terminals during resistance measurements. Control is via MMV/R_L. The current source is also disconnected when the unit is powered down.

Switch IC17 and relay RLA set the current source to the value required. Control is as follows:-

Current	MMR_1	MMR_2	IC17	RLA
0.5µA	Low	High	pins 1 to 2	pins 12 to 9
5µA	High	High	pins 1 to 8	pins 12 to 9
50µA	Low	Low	pins 1 to 2	pins 5 to 8
500µA	High	Low	pins 1 to 8	pins 5 to 8

Current source and ohms protection

IC20 acts as the current source for resistance measurements. The arrangement is basically an inverting amplifier circuit with the resistance being measured being placed in the feedback path. The voltage source is either –10 V or –0.991 V as selected by IC17 and the input resistor selected between 20 kΩ and 2 MΩ by RLA (see previous section).

Knowing the current through the feedback resistance allows the voltage across the resistance under test to be measured using the differential amplifier and the resistance calculated.

Protection against inadvertent application of voltages likely to cause damage is by diodes D4(a)/(b) and zener diodes D7 and D8, which protect the input and output of IC20 respectively. IC19 comparators act when the voltages across sensing-resistors R103, R161 and R162 exceed the reference voltages set by R92/93 and R104/105, setting TRIP_L low. This signal then disconnects the current source from the input by setting D-type flip-flop IC15(a) (sheet 3), turning off relay driver TR5. The OHM_TRIP output from IC15(a) indicates to the µC that the circuit has tripped. To reset the trip condition, the flip-flop is reset by setting MMV/R_L control bit low, then high again.

V/I and CMRR CAL switches (sheet 4)

Relay RLC switches the inverting differential amplifier input between the front panel voltage/resistance and the current inputs selecting current when control line MMVR/I_L is low.

For current measurement, calibration switches IC21-22 are switched several times a second. Normally, IC21 is open and IC22 closed, but in the opposite state the two inputs to the differential amplifier are connected together and to the I terminal. This allows only the common-mode error to appear at the output. This error can then be calibrated out of the current reading by alternately reading error and current measurements.

Differential amplifier

The basic differential amplifier is formed by IC24. A high common-mode voltage capability is provided by high-value input resistors R106-111 and IC23. Volts ranging is controlled by two halves of a quad analog switch IC25 (bottom right of drawing). This sets the gain of the differential amplifier to either ×1 or ×0.01 by altering the amplifier feedback resistance. Gain is ×0.01 when the MMGAIN control line is low.

To protect the differential amplifier, relay RLE disconnects it from the front panel inputs when not in use during power up and power down.

RF calibrator (sheet 5)

The RF calibrator provides either a 10 MHz sine wave at 0 dBm, or presents a 50 Ω load at its output, which is connected to the AA1 input switch where, during calibration, it is switched to the broad-band power meter AB1/AB2.

The 10 MHz square wave signal from IC13(b) is conditioned by the band-pass filter L5, C21 and C22 and the resulting 10 MHz sine wave is input to the current controlled variable gain amplifier TR6 (a), (b) and (c). The signal is then buffered by TR7 and filtered by C13, C15, C17, C18 and L7. The gain of the amplifier is determined by the voltage on the base of TR6(a) which, in turn, is determined by comparing in the integrator IC27 the output level (detected by D13) with a voltage derived by R126 from the +10VREF reference voltage. The output of IC27 then provides, via R131, the current control of the variable gain amplifier.

RF calibrator on/off control is from IC7 which is designated control latch 3 and has been previously described. The RFCAL_ON control signal performs two functions:-

- Switches the +12 V power supply to the gain controlled amplifier TR6 and TR7 via TR8 and TR9.
- Switches the RFCAL output with the SPDT relay RLD via the output switch control monostables IC28(a) and (b), and the relay drivers TR10 and TR11. Monostables are used because the relay coils only require short pulses to change over the contacts. In the off condition a nominal 50 Ω is placed on the RFCAL output.

A8 Complex modem and IF board

Circuit diagrams: Fig. 7-95 to 7-107

Introduction

The A8 assembly provides a digitised IF with 700 kHz bandwidth for the demodulation and analysis of complex modulation schemes and a complex (I, Q) signal generator for the generation of digital modulation schemes.

This description covers the:-

- Receiver IF path, where a 10.7 MHz signal from AE4 is mixed down with a buffered 10 MHz and is fed to the ADC through digitally controlled amplifiers.
- I/Q generation DACs, filters, and modulator, the up conversion from a 10 MHz IF to a 70 MHz IF, 80 MHz distribution, levelling loop, and output attenuator.
- Phase-Locked Loop (PLL) used for generating a variable frequency signal for the Systems Timing Element (STE).
- Switches used to route the reference frequency into and out of the instrument.
- Digital sections.

Circuit description

Receiver

IF path (sheet 1)

The 10.7 MHz IF signal from AE4 PLB is received on A8 SKC at a maximum level of −16 dBm (the actual level can vary between −16 dBm and −25 dBm due to attenuator setting and radio transmit level). After termination, it is amplified by TR10 before filtering to remove harmonics of the IF and 80 MHz LO signal. A 15 MHz Chebyshev 7th-order low-pass filter is used. This provides approximately 20 dB insertion loss at 20 MHz, with a worst case group delay variation of 1.5 ns in a 400 kHz bandwidth at 10 MHz. The nominal filter insertion loss at 10 MHz is 1 dB. The filter is followed by a double-balanced mixer with a LO frequency of 10 MHz to produce a 700 kHz IF signal. Selection of the 700 kHz sideband is achieved using a 2 MHz low-pass filter, which is a 5th-order Butterworth design with 50 Ω input and 100 Ω output impedance, providing 60 dB rejection to the 10 MHz LO and upper sideband.

The filter is followed by the AGC amplifier, which provides 0 to 80 dB gain controlled by two control voltages, each having a control range of 40 dB for a voltage range of ±0.625 V. The gain of the amplifier is controlled by the MAP processor to keep the received signal level optimum for the dynamic range of the input of the A-D converter.

10 MHz local oscillator buffer (sheets 1, 11)

To maintain the dynamic range of the receiver measurement, it is essential that in-band spurious signals are kept to a minimum; this puts an additional requirement on the receiver local oscillator that it should be free of unwanted signals which may, after mixing, appear in the IF bandwidth. The 10 MHz LO is derived from the 80 MHz signal by means of division in the STE (page 1-82); it is then passed to a crystal filter formed around TR11. The crystal is the part of the gain-control network in a series-feedback transistor amplifier. At series resonance of the crystal, fine tuned by C63, the crystal impedance drops to that of the ESR and the maximum signal is developed at the input to the following stage. At parallel resonance, the crystal impedance is at a maximum and no signal would be delivered to the load; at this time, a phase-shifted version of the input signal is added to the output via C61 to produce a symmetrical filter shape, thus the filter symmetry is controlled by the stage gain and the phase shift due to this capacitor.

The filter bandwidth is set by R73 and is nominally 1.5 kHz to allow for crystal and reference frequency tolerances. The filter stage is followed by an emitter-follower buffer to drive 10 dBm into the receiver mixer.

Quadrature generator

I/Q DACs and filters (sheet 2)

The I/Q DACs and filters convert the digital I and Q signals to analog signals and remove the DAC clocking frequency. The filters are 5th-order Bessel filters. Each I and Q filter uses half of each operational amplifier package to match the filters. The filters are DC-coupled to aid testing.

The digital I and Q information is clocked into the I and Q DACs IC13, IC14 at a rate of 1.0833 MHz. The same reference voltage provided by IC12 is used for both DACs as well as the output attenuator and levelling loop. Each DAC produces a current output that is converted to a 0 V to –5.0 V swing by operational amplifiers IC15(a), IC15(b). The next operational amplifier stage IC16(a), IC16(b) provides a level-shift up to +2.5 V to –2.5 V and the first pole of the Bessel filter. The final four poles are configured around the operational amplifiers IC17(b), IC17(a), and IC17(c), IC17(d). The filters provide 25 dB of attenuation at 1 MHz.

All the resistors used are specified as 0.1% and the major capacitors as 1% to ensure close gain and phase matching between the filters and to keep the group delay within ±12 ns over the DC to 300 kHz band. For the same reason, the operational amplifiers were chosen to have high open-loop gain over this band.

Splitter (sheet 2)

The splitter is required to provide two signals, nominally 10 MHz, that are 90° out of phase, to the I/Q modulator. These signals are generated digitally from a 40 MHz input. IC20, a dual D-type flip-flop 74F74, is connected to divide by 4 and provides two 10 MHz TTL LO drives with the correct phase relationship for the I/Q modulator.

I/Q modulator (sheet 2)

The I/Q modulator modulates a 10 MHz IF with the I and Q base-band signals. The required accuracy of the modulator is to maintain the carrier and unwanted sideband at <–48 dBc. The I/Q modulator consists of a pair of MC1496 balanced modulators, IC18, IC19, connected so that their outputs add. To ensure matching, and to reduce components, the MC1496s are biased together. The TTL signals from the splitter are attenuated by resistors R110-R113 to reduce carrier feedthrough. The gain of the combined modulator is such that 4.7 V pk-pk I and Q signals produce –16 dBm in the 50 Ω output.

10 MHz to 70 MHz up converter (sheet 3)

The output from the I/Q modulator, at 10 MHz and –16 dBm, is fed to a filter similar to that used in the receiver IF path (see page 1-77 and sheet 1). The 10 MHz modulated IF signal is then passed to the up-conversion mixer, where it is mixed with a buffered 80 MHz signal; the resulting sideband signal level being –21 dBm. The signal level is increased by approximately 18 dB by the MSA 0386 amplifier IC9 before being fed to a 70 MHz SAW band-pass filter IC67, which is used to select the lower sideband and reject the carrier and upper sideband frequencies. Although the SAW filter has an input impedance of 1.5 kΩ, it is driven from a low impedance (nominally 50 Ω) to reduce ripple due to reflections within the filter structure. The balanced filter output is terminated in its characteristic impedance of 800 Ω using a differential amplifier, the outputs of which are summed using a trifilar transformer T1. The SAW filter has an in-band insertion loss of approximately 27 dB, and a group delay variation of about 4 ns in a 400 kHz bandwidth at 70 MHz. The overall group delay is 1.12 µs. The differential amplifier, TR6, TR7, provides a further 12 dB gain into a 50 Ω load, thus the output to the levelling loop is approximately –19 dBm. The filter stage provides about 37 dB rejection of the local oscillator and upper sideband.

80 MHz local oscillator distribution (sheet 3)

The 80 MHz 3rd local oscillator from the receiver chain on AE5 is fed to A8 SKE to be used as the master clock for the DSP (16 MHz), the PPH processor (10 MHz) and the local oscillators for the IF system (10 MHz and 80 MHz). The feed from AE5 is terminated and amplified by TR8 to overcome the termination loss and routed to A5 PLF, where it is used for clock generation. The received level at A8 is nominally 1 V pk-pk (4 dBm), and this is split into two paths, to TR8 and TR9.

The signal from TR9 collector, with a voltage gain of approximately 1.5 dB, is fed to a 74AC04 inverter IC8(a), configured as an amplifier, to produce a 4 V square wave. IC8(a) has DC feedback to maintain its bias at mid-rail voltage but is used open loop at 80 MHz. The 80 MHz signal is fed via IC8(c) to the STE (page 1-82) for clock generation and through a divider IC1 to SKB for use on A4 as a 10 MHz clock.

The signal from TR9 emitter is attenuated by 18 dB before being fed to an MSA 0886, IC10, which has a gain of 32 dB. The output signal is attenuated by 3 dB before driving the LO port of the up-conversion mixer at a nominal level of 0 dBm. The attenuation included in this circuit provides two functions; to ensure that the MSA 0886 and the mixer see a good termination and to ensure that sufficient isolation can be maintained between the two signals from TR9. Typical isolation from the mixer LO port to the A5 output (SKD) at 10 MHz is >75 dB.

Voltage reference (sheet 4)

The 5 V reference used by the DACs (page 1-78) is converted to 7 V and −790 mV for use by the levelling loop and the output attenuator. This is done by IC5(b) and IC2 in conventional operational amplifier configurations.

Levelling loop (sheet 4)

The levelling loop has six elements: a voltage-controlled attenuator, a fixed-gain amplifier, a low-pass filter, an emitter-follower buffer, a detector, and an integrator that provides feedback to the attenuator. The levelling loop provides a constant output, nominally 2 dBm, for an input of −19 dBm ±3 dB

The attenuator is formed by matched pin diodes D3 in a T network. These diodes are biased by D2, resistors R11 to 15, and inductor L1. Current setting resistors R13 and 15, together with the control voltage, set the bias current for the two series diodes. The network of R11,12,14 and D2 set the current for the shunt diode.

The DC control voltage varies from 0 V (maximum attenuation, ≅55 dB) to −5 V (minimum attenuation, ≅3 dB). The nominal attenuation of 13 dB is provided by a control voltage of ≅0.8 V.

The amplifier is made up of an MSA 0886, IC6, and an MSA 1105, IC7, which have nominal gains of 32.5 dB and 12.5 dB respectively. The second stage uses a parallel combination of mini-MELFs (R17, 18) to set the 59 mA required by the MSA 1105.

Inductors L4, L5 with C13, 14 and 15, constitute a 5th-order Chebyshev low-pass filter. A 0.1 dB ripple factor was chosen, since this provides a good compromise between group delay and attenuation of harmonics and intermodulation products. R19 provides a matched 50 Ω load.

Transistor TR5 is biased as an emitter-follower with a collector current of ≅30 mA. This provides a low impedance to the detector without introducing a large second harmonic.

The signal is peak-detected by diode D4(b), C5 and R9. A series resistor, R24, increases the load impedance that the detector presents to TR5. IC3(a), with D4(a), R7, R8 and C4, provides buffering and a degree of temperature compensation to the detector output voltage.

Operational amplifier IC3(b) integrates the difference between the set-point of −790 mV, and the detector output. The time constant is set by R6 and C3 such that the levelling loop can make a ≅6 dB transition in attenuation in 1 second. C2 provides stabilisation. TR1, TR2 and R5 provide a current buffer for the IC3(b) output.

Output attenuator (sheet 4)

The output attenuator is made up of two back-to-back stages. Each of the stages is similar to the attenuator used in the levelling loop. Two stages are used to achieve an improved return loss. This is achieved with the CR networks, C20/R26 and C24/R37. The series combinations of the shunt PIN diode resistances and the CR network impedances provide input and output impedances of ≅50 Ω.

The control voltage to the attenuator is provided by the DAC IC4. This is a 12-bit serial interface DAC controlled by the system timing element (STE), shown on sheet 11. The DAC uses a 7 V voltage reference supplied by the voltage reference circuit.

IC5(a), together with TR3, TR4 and R10, functions as a current-to-voltage converter, using the feedback resistor within the DAC. TR3, TR4 and R10 provide current buffering of IC5(a), since the output attenuator draws up to 50 mA of bias current from that output. C129 slows down the converter so that it settles in 15 µs but does not produce any high frequency spikes that can be detected by the levelling loop detector.

The full scale output attenuator control voltage is nominally –(7×4095/4096) V. The resolution of this DAC is therefore approximately 1.71 mV/bit - adequate for a sensitivity of ≅0.1 dB/bit, for attenuations up to approximately 40 dB.

Phase-locked loop (sheet 5)

The phase-locked loop (PLL) provides a variable frequency TTL signal to the STE (page 1-82). It has a frequency range of 72-79 MHz and a phase error of 0.2° RMS. The PLL consists of a VCO, a synthesizer chip, and an analog filter. The synthesizer chip is fed by a 10 MHz reference signal and can operate at a comparison frequency of 25 kHz, for 25 kHz resolution, or 100 kHz for lowest phase noise.

The VCO is a common-collector Clapp oscillator built around a BFR 93A and a 330 nF chip inductor, TR13 and L24. The nominal tuning range is from 69-81 MHz to allow for component tolerances. The phase noise at 20 kHz offset is better than –120 dBc/Hz across the band. The +12 V rail is regulated down to 8.6 V by IC21.

The synthesizer chip IC23 is a Motorola MC 145170D which has a maximum input frequency of 160 MHz, so it does not require a pre-scaler. The digital input is fed serially over a 3-wire bus from the STE. The double-ended phase detector outputs are used for maximum phase detector gain. The synthesizer chip is powered by its own +5 V regulator IC22.

The analog filter uses two low-noise operational amplifiers IC24, IC25. The first operational amplifier, an OP-27, integrates the difference between the two phase detector outputs. The second operational amplifier, an NE5534, implements a 3-pole Chebychev low-pass filter with a cut-off frequency of 14 kHz. The 25 kHz sidebands are attenuated to <–60 dBc over the band. The settling time, to within 1 kHz, is <3 ms for any frequency step.

Reference frequency switches (sheet 12)

To enable the system reference frequency (13 MHz for GSM) to be available for input or output at the rear panel socket, the cable from AR1 to the rear panel connects to A8. When a system reference output is required at the rear panel, the system clock is switched into the feed and the 10 MHz from AR1 is disconnected; the drive is buffered using two inverters in a direct replication of the AR1 drive circuit. An external system reference can be accommodated by dividing the signal (by 13 for GSM) to produce a 1 MHz signal to synchronize with the AR1 reference oscillator. The switch used is a DG540, which is capable of producing >70 dB isolation at 10 MHz. The reverse power protection circuit is again a direct copy of that used on AR1.

Digital circuits

In-phase modulation generator processor (sheet 6)

The In-phase modulation Generator Processor (IGP) is based around the ADSP2115 DSP IC26 with external program and data memory (ICs 27-29). ICs 27, 28 are 32K × 8 devices, the lower 16K in each being mapped into the DSP's data memory space by connecting the DSP's /DMS line to A14 of the RAM. IC29 is an 8K × 8 device that is mapped into the DSP's program memory space, along with the upper half of the 32K devices. This arrangement results in 8K of 24-bit program memory being available externally, plus 6K of 16-bit program memory for use as data memory and 13K of external data memory.

IC30 provides fast memory and I/O decode. The 15 ns access time external memory must operate with zero wait states, so the decoder must have a propagation delay of less than 10 ns. Three I/O decodes are provided, although only one is used, namely DWR60. This enables writes into the output FIFO IC31, which queues samples and feeds them to the I channel DAC (IC13, sheet 2) under the control of the STE (page 1-82).

IC30 also provides four general purpose outputs, AUX3-0, which are fed to the STE for timing, synchronization and control functions. The ninth bit of the FIFO is fed to the STE as a synchronization strobe.

IC30 also provides a bridge interface between the DSP and the 68000 host processor on A4. The bridge may be programmed to generate interrupts on the DSP's /IRQ0 pin under ready-to-receive or ready-to-send conditions. The bridge also provides the means by which the DSPs acquire their bootstrap code.

DSP reset is controlled by the host on a dedicated reset line supplied on PLD. Host access to the bridge is via the host's bridge select line, IGPBRI(L) supplied on PLC (sheet 11), the read-not-write line on PLB (also sheet 11) and the A4-A8 data bus on PLB and PLC. The host bridge status lines (Tx Ready and Rx Ready) are fed to PLB.

The highest priority interrupt, IRQ2, is derived from the STE in the form of the IGP_SYNC line, which has a system-specific function.

The IGP's serial port sends to and receives from the STE, which performs SPORT routing functions.

Quadrature-phase modulation generator processor (sheet 7)

The Quadrature-phase modulation Generator Processor (QGP) is similar in every respect to the IGP with the exception of the receive half of the serial port, which is derived directly from the A4-A8 SPORT connector.

Modulation analysis processor (sheet 8)

The Modulation Analysis Processor (MAP) is similar to the IGP, having the same type of bridge controller and memory decoder (IC44). Memory arrangements differ slightly in that three 32K × 8 devices (IC39-41) are used to provide 14K of 24-bit external program memory. Four pages of 13K × 16-bit external data memory are provided in four 32K × 8 devices (ICs 42, 43 and 45, 46).

Although the pin-out of the bridge controller and memory decoder is identical for all the DSPs, the design differs slightly to enable paged accessing of the external data memory. This is achieved by writing the desired data page into the lower two bits of the AUX register.

The MAP controls three peripherals, the receiver sample FIFO IC57 (sheet 10) and the AGC control voltage DACs IC59 (sheet 10). The term FIFO is a slight misnomer, as the MAP actually reads from 32 individually-addressed, RAM-like locations. When full, the FIFO can generate an interrupt on the DSP's /IRQ1 pin. Five address lines give the MAP access to 32 addresses within the receiver FIFO. Write access is provided to control the depth of the FIFO (i.e., to control the number of samples that will be stored before an interrupt is generated. A0 selects the AGC1CTL or AGC2CTL latch (sheet 10) when addressing the DAC. The AGC DACs are write only.

The MAP's SPORT receives from and transmits to the STE (page 1-82), which performs signal routing.

Real-time demodulation processor (sheet 9)

The Real-time Demodulation Processor (RDP) is similar to the MAP in almost every respect, with the exception that it has no control over the AGC DAC and the SPORT transmits to the A8 SPORT port.

Receiver ADC and FIFO (sheet 10)

The 2.8 MHz sampling clock is fed from AE8 at a nominal level of 0.1 Vp p. This is squared up through a high speed comparator IC65 to minimise the phase noise on the sampling clock, which is then fed to the ADC IC56 and the receiver FIFO IC57.

The ADC reference out is fed to the reference in and decoupled by C174. IC58 buffers the reference to the AGC DACs IC59. Being a current output device, it is necessary to follow the DAC with a current-to-voltage conversion stage. Current-to-voltage conversion and level shifting to achieve a ±0.625 V swing for both channels is accomplished using a TL074 quad operational amplifier IC60.

The receiver FIFO is a XILINX device, type XC4003, which is configured serially by a master XILINX device on A4. The programming data and control signals are received via PLF, the LCA configuration port. The receiver FIFO's serial configuration DOUT pin drives the STE IC61 (sheet 11, see below) for daisy-chain programming. The three mode pins are tied high to configure the device in serial-slave mode.

System timing element (sheet 11)

The system timing element (STE) IC61 is a XILINX device, type XC4005, which is configured serially by a master XILINX device on A4 via the Receiver FIFO IC57 (sheet 10). Programming control is as for the Receiver but data is sourced from the Receiver FIFO's configuration data output pin.

The STE generates clocks and synchronization signals for use throughout the A8 board. The host processor on A4 has access to the internal registers of the STE via the data bus delivered on PLB and PLC.

Boundary scan and FLEX logic programming (sheets 6 to 11)

Both XILINX gate arrays and the four FX740 devices have boundary scan testability ports. Because the FX740 devices are configured through the boundary scan port, they cannot easily be combined into a single boundary scan bus. Therefore two buses are provided, the 'A' bus (ATMS, ATCK, ATDI0, ATDI1, ATDI2 on sheets 10,11), which accommodates the two XILINX devices, and the 'P' bus, which carries the programmable FX740 parts. The 'P' bus (PTMS, PTCK, PTDI0, PTDI1, PTDI2, PTDI3, PTDI4 on sheets 6, 7, 8 and 9) can be controlled by the STE when the board is operating within the test set, enabling the host processor to configure the devices. During autotest, however, the STE pins to the 'P' bus may be tri-stated, thus enabling the tester to manage the 'P' bus.

The FX740s power up in a tri-state mode if the EPROM is not programmed (as is the case for the A8 board). Consequently all the decoder and interrupt outputs must be pulled to their inactive states with external resistors.

AE1 Fractional-N control board

Circuit diagrams: Fig. 7-109 to 7-113

Introduction

Fig. 1-9 is a simplified block diagram of the board, with interconnections. The board is controlled from and communicates with the A6 CPU, and, in turn, controls the RF tray in which it is situated. It uses two similar fractional-N divider circuits, one to control receiver frequency selection, and the other to control signal generator frequency selection. A 1-bit ADC circuit is added to the fractional-N control circuit for the signal generator, enabling FM and PM to be injected into the loop and hence appear at the signal generator output.

Each of the fractional-N divider circuits on the AE1 board is part of a phase locked loop. That for the receiver includes circuitry on the AE2 board. That for the signal generator includes circuitry on the AF2 board.

Conventional dividers allow only integer division ratios. However, dividing by N for some of the time period, then dividing by N+1 for the remainder, results in an average division ratio which is not necessarily an integer. The fractional-N phase locked loop system takes this principle further by switching through several different division ratios, according to a complex algorithm. This results in an average fractional division ratio, with reduced fractional-N sideband levels.

Microcontroller and communication circuits (sheet 1)

IC4 is an I^2C compatible, general purpose µC. In this application, its function is to drive the two fractional-N devices on AE1 and the rest of the RF tray via I^2C controller IC6. IC6 provides an I^2C interface to the RF tray which is separate from the system I^2C bus. IC7 is a booster which is required because of the high capacitive load presented by the RF tray filters. The RF tray I^2C interface is unidirectional and supplies boards AE6-7, AF2 and AF4-6.

The eight least significant bits of the µC address bus are multiplexed with the data bus. The 8-bit latch IC2 is used to extract the address to allow interfacing with memory. Memory comprises 32K of RAM (IC9) and either 32K or 64K of PROM (IC5).

Address decoder IC3 provides chip select signals for the two fractional-N devices (sheets 2 and 4) and the I^2C controller, these devices being mapped into the µC's memory space.

Receiver fractional-N circuits (sheet 2)

Note that these circuits form only part of the receiver fractional-N loop. The theory of the signal generator fractional-N loop, which is similar, is described in the AF2 board section.

The loop input to the circuit is the LO frequency ÷2 from AE2. This is fed to programmable divider IC11 which is controlled by fractional-N device IC10. The divided output is level shifted (ECL to TTL) by TR1, TR2 and TR8, frequency doubled by IC12 and IC13(a) and fed to the phase/frequency detector on AE2 board.

Single-bit ADC (sheet 3)

The FM and PM modulating signal from the A1 audio generator board is applied to both the AE1 and the AF2 RF oscillator board. AE1 handles the frequency and phase modulation of low frequencies and AF2 that of high frequencies. The way in which the transition between the two is handled is described in the AF2 board description. Here, we are only concerned with how the 1-bit ADC circuit allows the low frequency component to be injected digitally into the fractional-N phase locked loop.

Signal EAU (top right of drawing) is a 0 V to 5 V feedback from the fractional-N signal generator IC17 on sheet 4. IC15(a) and associated components R32 and R33 apply an offset causing the junction of R35 and R36 to swing equally above and below 0 V.

The FM DRIVE signal varies the mark/space ratio of the BS signal to IC17 in accordance with the feedback via the EAU signal. While FM DRIVE is high, the BS signal becomes a narrow negative going pulse; when FM DRIVE is centred, the pulses have an even mark/space ratio; when the FM DRIVE reaches its lowest extreme the BS signal becomes a series of narrow positive going pulses. These pulses modify the programmable divider IC18 and modulate the signal generator via the phase detector on the AF2 board.

More information on the modulation levels produced is given in the AF2 board description.

Signal generator fractional-N circuits (sheet 4)

Note that these circuits form only part of the signal generator fractional-N loop. The theory of this loop is described in the AF2 board section.

The loop input to the circuit is the signal generator frequency ÷2 from AF2. This is fed to programmable divider IC18 which is controlled by fractional-N device IC17. The divided output is level shifted (ECL to TTL) by TR4, TR5 and TR7, frequency doubled by IC19 and IC20(a) and fed to the phase/frequency detector on AF2 board.

Signals BS to pin 54 and EAU from pin 34 of IC17 are associated with the 1-bit ADC circuit described in the previous section.

Supply lines and filters (sheet 5)

Filtering of the +5 V, +12 V and –12 V supply lines is provided by L1 to L3, R61/R62, capacitors C40 to C43 and capacitors C47 to C50.

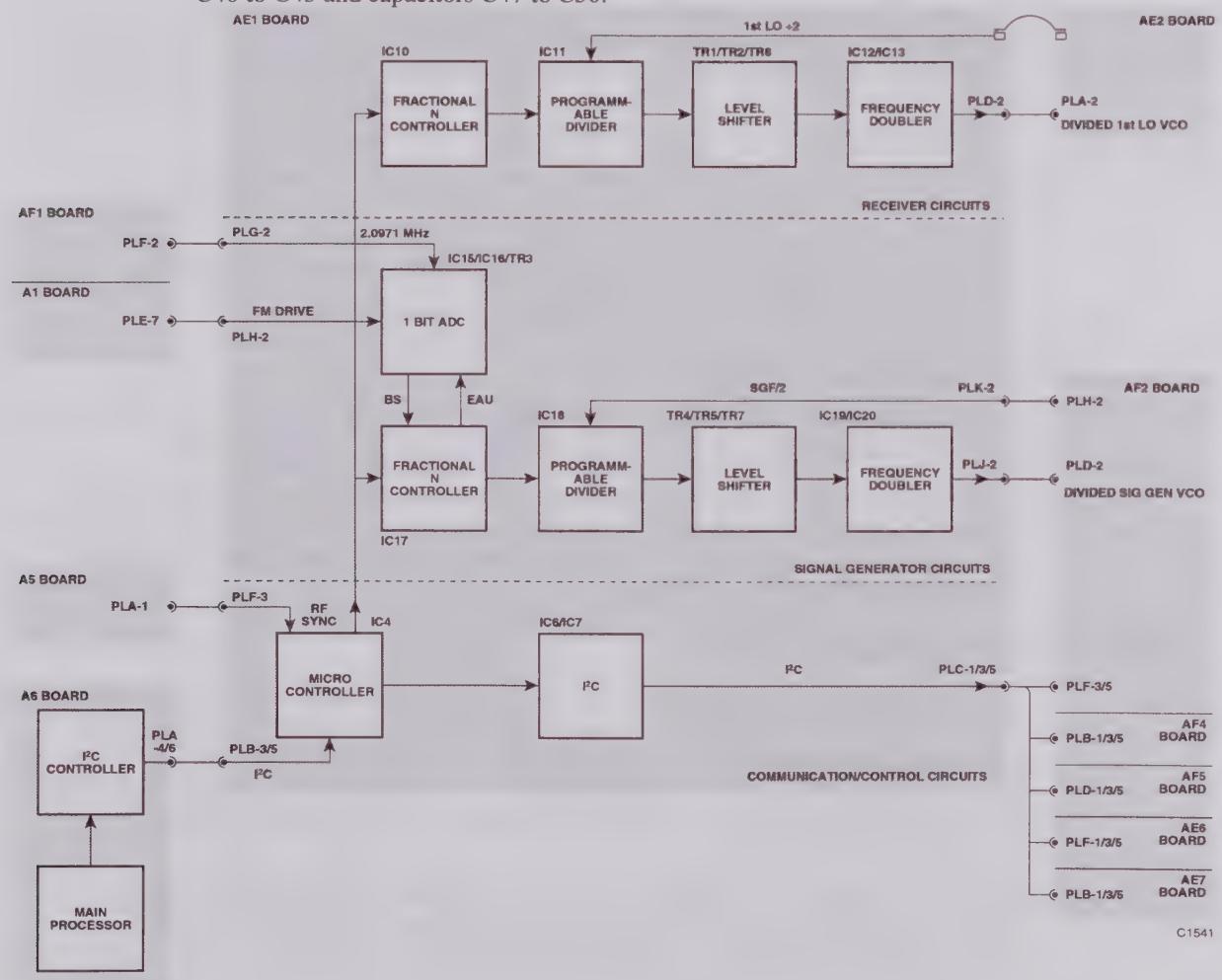

Fig. 1-9 AE1 board - block diagram

AE2 1st LO synthesizer board

Circuit diagram: Fig. 7-115

Introduction

Fig. 1-10 is a block diagram of AE2. This board provides the 1st local oscillator frequency signal to the first mixer board AE3 via a PCB pad. Its main inputs are a 2.0971 MHz REF signal from the AF1 board and the divided 1st local oscillator signal from AE1. The board also provides the feedback signal (LO ÷2) for the fractional-N control circuit on AE1.

Line cleaners

Line cleaners IC1/TR1 and IC2/TR2 prevent noise on the +32 V and +12 V supply lines from introducing phase noise via the VCO. Circuits for +32 V and +12 V line cleaning are similar so only one will be described.

The inverted input of IC1 is biased by the potential divider R2, R3 and R6, with the input maintained at an AC earth via the long time-constant R4 and C3. Any AC current transients on the power line are developed across R1 and applied via zener diode D2 to the non-inverted input. IC1 output drives the base of TR1 to compensate for the transient current change in the power supply.

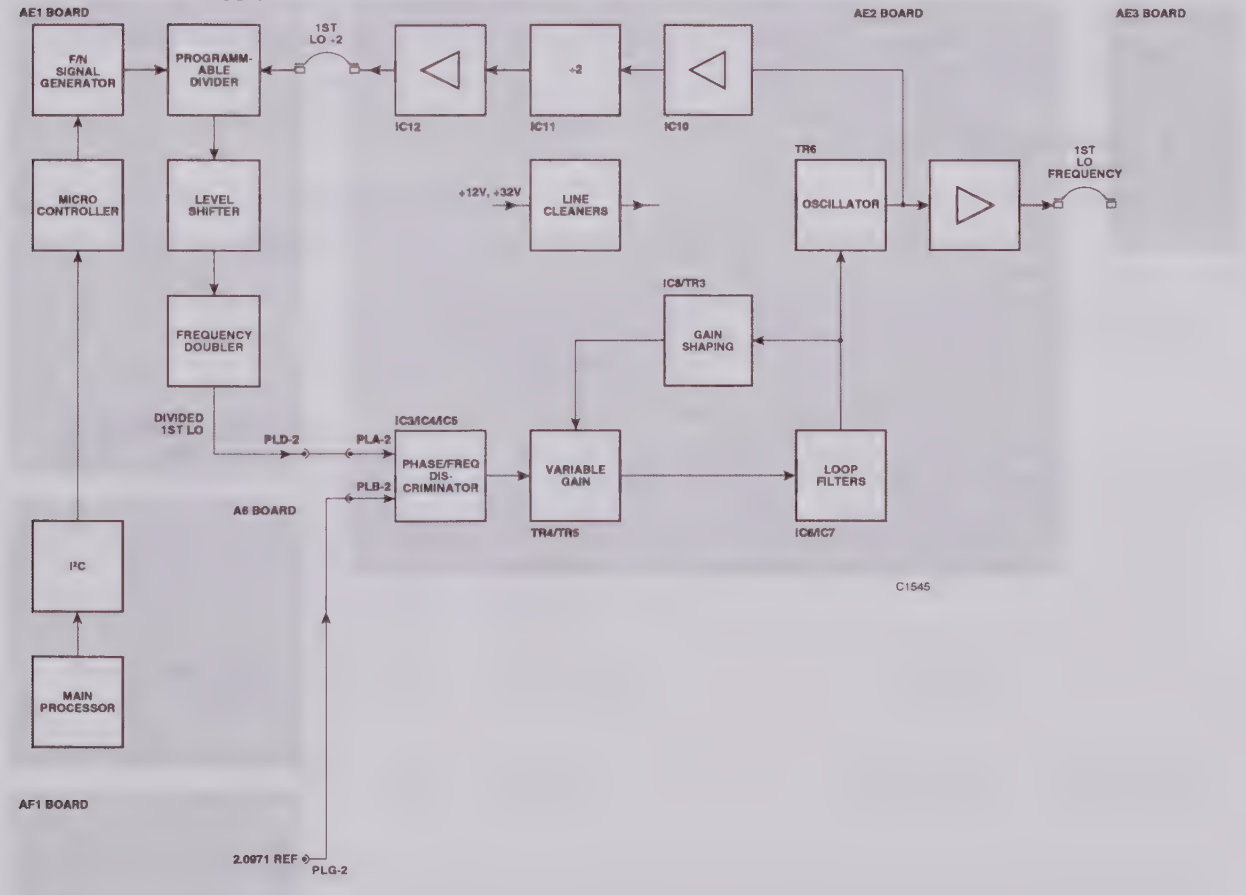

Fig. 1-10 AE2 board - block diagram

1.35-2.35 GHz oscillator and ÷2

TR6 and associated components form a VCO which tunes from 1.35 GHz to 2.35 GHz under voltage control of between 2 V and 21 V at the junction of varactor diodes D12 and D13. The signal path to the AE3 board is amplified by IC9.

The VCO output is amplified by IC10, divided by 2 in IC11 and amplified by IC12 before passing to the AE1 board. The ÷2 output to AE1 is in the range 675 MHz to 1175 MHz.

Phase/frequency discriminator and loop gain control

The phase/frequency discriminator IC3(a), IC4(a), and IC5(a) to IC5(d) provides differential outputs indicating the phase/frequency difference between the two inputs.

An automatic variable gain control loop is provided to compensate for the oscillator's non-linear control voltage/frequency characteristic. Thus the gain of TR4 and TR5 is controlled by the current mirror TR3 which is, in turn, controlled by the conditioned VCO frequency control voltage from IC7 via IC8.

IC8(a) is a non-inverting unity gain amplifier isolating the preceding circuits from the gain shaping circuits. R38, R39 and IC8(c) set a reference voltage of approximately 8.9 V. When the tuning control voltage is below this value D9 is forward-biased, clamping IC8(b) pin 5 to 8.9 V, and IC8(b) functions as a buffer. As the oscillator's frequency control voltage rises above 8.9 V, diode D9 turns off and releases IC8(b) pin 5 to follow IC8(b) pin 6, allowing IC8(b) pin 7 to follow the oscillator's frequency control voltage via R35. This output then sets the operating current in TR3.

AE3 First mixer board

Circuit diagram: Fig. 7-117

AE3 generates a 1349.3 MHz IF signal which is fed to the AE4 board. Main inputs to the board are:-

- 100 kHz to 1000 MHz RF signal from the front panel.
- 1.35 GHz to 2.35 GHz 1st LO signal from AE2.
- RX PREAMP (L) control signal from A6 CPU.

Wideband amplifier IC1/IC2 provides 20 dB gain. It can be bypassed by relays RLA and RLB which are operated by relay driver TR1. TR1 is controlled by signal RX PREAMP L.

L2 to L7 and C1 to C6 comprise a 1 GHz low-pass filter whose characteristic can be adjusted by C1 to C5. C2 and C4 are adjusted for a shoulder at 1.1 GHz, while C1 and C5 are adjusted for a notch at 1349.3 MHz (the 1st IF frequency). A 3 dB pad attenuates the low-pass filter output, and matches its output impedance to the input of the balanced mixer IC3.

A 2 GHz low-pass filter comprising C16 to C21 and L11 to L17 removes the upper second-channel component from the mixer's output signal.

AE4, AE4/2 IF board

Circuit diagram: AE4 Fig. 7-119
AE4/2 Fig. 7-121

This description applies to both AE4 and AE4/2. The boards are very similar, the only significant difference being the use of a ceramic filter on AE4/2.

AE4 (or AE4/2) generates two 10.7 MHz IF signals, one being fed to the AE6 board, and the other to the rear panel IF socket. Main inputs to the board are:-

- 1349.3 MHz IF signal from AE3.
- 1280 MHz 2nd LO signal from AE5.
- 80 MHz 3rd LO signal from AE5.

The IF input from AE3 is fed to:-

On AE4: A helical filter with four elements comprising series input and output tuned circuits and two parallel-tuned filters. The four sections are adjusted by C1 to C4 for 1349.3 MHz with a bandwidth of 20 MHz thus providing rejection of the fixed image frequency of 1210.7 MHz. C2 and C3 adjust the centre frequency, and C1 and C4 adjust the skirt cut-offs.

On AE4/2: A ceramic filter FL1 with a centre frequency of 1349.3 MHz and a bandwidth of 25 MHz.

The amplifier IC1 together with R1 isolates the filter from the balanced mixer stage. IC1 provides a gain of approximately 20 dB to compensate for losses. IC2 mixes the 1.28 GHz 2nd LO input signal from AE5 with the 1.3493 MHz signal from the filter to derive the 69.3 MHz 2nd IF signal.

A band-pass filter C6 to C13 and L6 to L9 is adjusted to remove the adjacent channel components of the mixing process from the signal path. Series components C6 and C7 are adjusted to the centre frequency of 69.3 MHz. C12 and C13 are adjusted to provide the maximum rejection of the third mixer's image frequency of 90.7 MHz. The resulting bandwidth is approximately 4 MHz.

Amplifier TR1 has a nominal gain of 16 dB and isolates the preceding band-pass filter from the mixer IC3. C14 is adjusted to the centre frequency of 69.3 MHz. This reduces the bandwidth further to that of the 3 MHz filter.

IC3 is a double balanced RF mixer. It mixes the 69.3 MHz second IF with the 80 MHz signal from AE5 to derive the two 10.7 MHz IF signals. Emitter-followers TR2 and TR3 provide low output impedances for the respective lines to the AE6 board and rear panel.

AE5 2nd and 3rd LO board

Circuit diagram: Fig. 7-123

AE5 provides the 2nd LO frequency (1280 MHz +10 dBm) and 3rd LO frequency (80 MHz –8 dBm). Both signals are fed to the AE4 board. Each of the oscillators generating these frequencies is part of a phase-locked loop circuit.

1280 MHz oscillator

TR1 is a voltage-controlled common-emitter Hartley oscillator. The varactor diode D3 forms part of the capacitive coupling between the inductors. The oscillator output is buffered by IC2 with 12 dB gain, to give a signal level of +6 dBm at C16. Components L8, L9, C17, R17 and C18 form a Wilkinson power divider at 1280 MHz with an insertion loss of 3 dB and provide 25 dB isolation between the two signal paths.

IC3 provides buffering and boosts the signal to the AE4 board to +10 dBm. IC4 and IC5 divide the signal by 16 to provide the controlled signal into the phase detector IC6 to be compared against the 80 MHz reference.

The phase detector IC6 is a double balanced mixer whose outputs are summed by IC1(a) and applied as an error signal to the search oscillator/loop amplifier IC1(b) which operates in two modes:-

- Before frequency lock, IC1(b) and associated components function as a Wien oscillator with nominal gain of 3 producing a 10 V pk-pk, 60 Hz square wave. This waveform sweeps the 1280 MHz oscillator about the phase lock point.
- When phase lock occurs, the loop gain of the Wien oscillator becomes greater than 3 and it stops oscillating. This permits control of the 1280 MHz oscillator to be exercised though phase difference alone.

If lock is lost, the loop gain becomes much less than the Wien oscillator gain, thus re-initiating oscillation to resume the search for a lock condition.

80 MHz oscillator

TR4, TR3 and associated components function as a Butler oscillator using a 5th overtone 80.0041 MHz crystal XL1. Frequency control is exercised by the varactor diode D4. L12 neutralizes the crystal's parallel capacitance and L13 increases the series inductance, the effect being to reduce the frequency and increase the frequency control provided by D4. L11, C50 and C51 form a parallel-tuned circuit, ensuring that oscillation occurs at the correct overtone. To provide the maximum amount of frequency control, D4 anode is returned to −12 V permitting a 22 V control range.

TR5's collector signal is the feedback for the phase locked loop. After level conversion by TR2, the signal is divided by 8 in IC7 to provide a 10 MHz clock to IC8(a). The 10 MHz reference signal from AR1 is the clock to IC8(b). Phase detector IC8(a)/IC8(b) generates antiphase outputs whose pulse width is proportional to the phase difference between the two clocks. Loop filter IC10 functions as an integrator subtracting the antiphase inputs, thus generating an output level proportional to the phase difference. This voltage is used to bias the varactor diode D4 to maintain the 80 MHz oscillator at the correct frequency.

Three 80 MHz outputs are taken from TR5's emitter. These are the 3rd LO signal to AE4 via TR7, a reference for the 1280 MHz oscillator via TR8, and a clock to the A5 board via TR6.

AE6, AE6/2 Spectrum analyzer board

Circuit diagrams: AE6 Fig. 7-126 to 7-129
AE6/2 Fig. 7-131 to 7-135

Introduction

This description covers the AE6 board and its replacement AE6/2. The boards are similar except for the log amplifier and video filter sections; these are described separately. Where there are only minor differences, AE6 references are shown in brackets.

Figs. 1-11 and 1-12 are block diagrams of AE6 and AE6/2 respectively. The board provides switchable and tuneable filtering and conditioning of the 10.7 MHz IF signal from AE4, controlled by I^2C bus signals from AE1. It produces WIDEBAND and NARROWBAND IF signals to AE7, an IF COUNT to A6 and a LOG AMP signal to the A5 display board.

I^2C control (sheet 1)

I^2C bus expander IC17 and 8-channel DAC IC16 are both interfaced to the I^2C bus from the AE1 board. IC17 provides routeing control of the various filters and of the video filters that form part of the log amplifier circuit (page 1-90). IC16 outputs are used to drive the adjustment circuits of the 5-stage crystal filter.

Switchable wideband filters (sheet 1)

Gain variations occurring in the conversion stages of the AE3 and AE4 boards are corrected by TR29 and TR30. R157 (SET GAIN) is set for a nominal −15 dBm (−17 dBm) level at TP11 when using 280 kHz or narrower filters. The signal is then applied to the 280 kHz and 110 kHz ceramic filter stages, each of which can be switched out. Where both are bypassed for 3 MHz bandwidth,10 dB of attenuation is added by R67 to compensate for the removal of 10 dB RF attenuation.

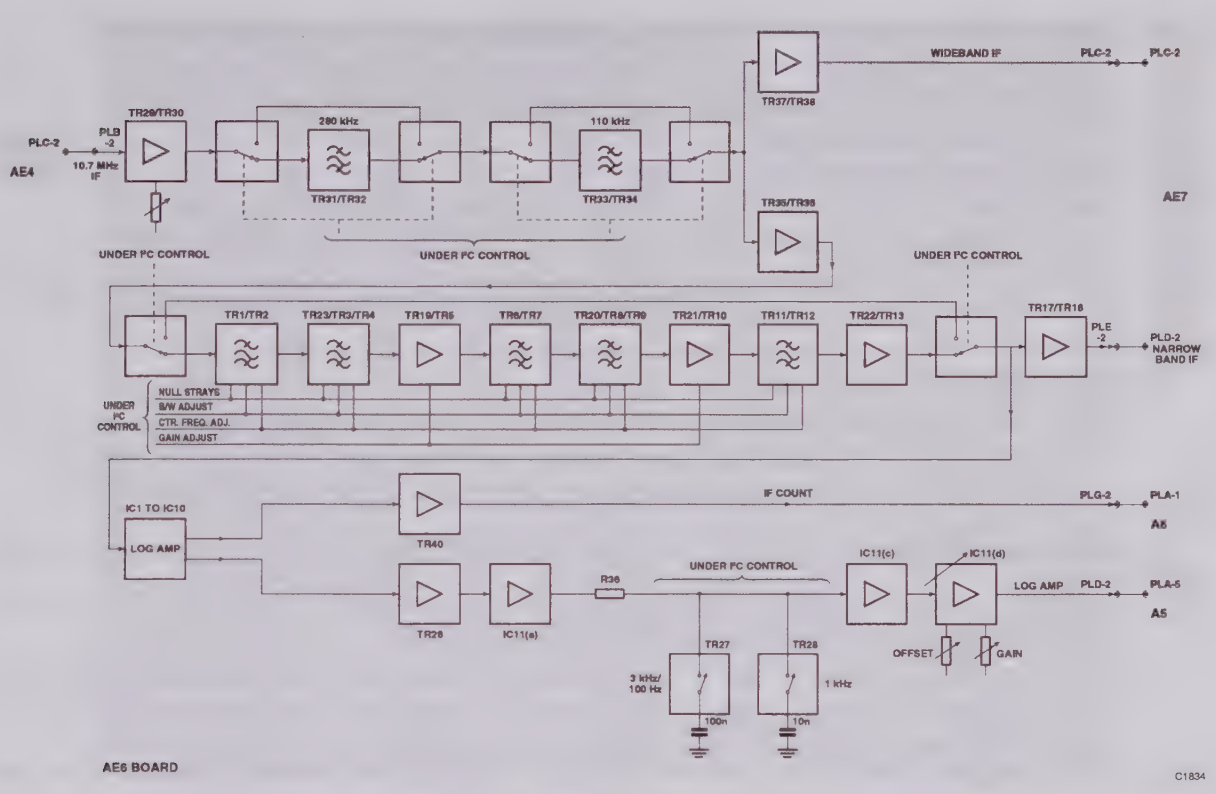

Fig. 1-11 AE6 board - block diagram

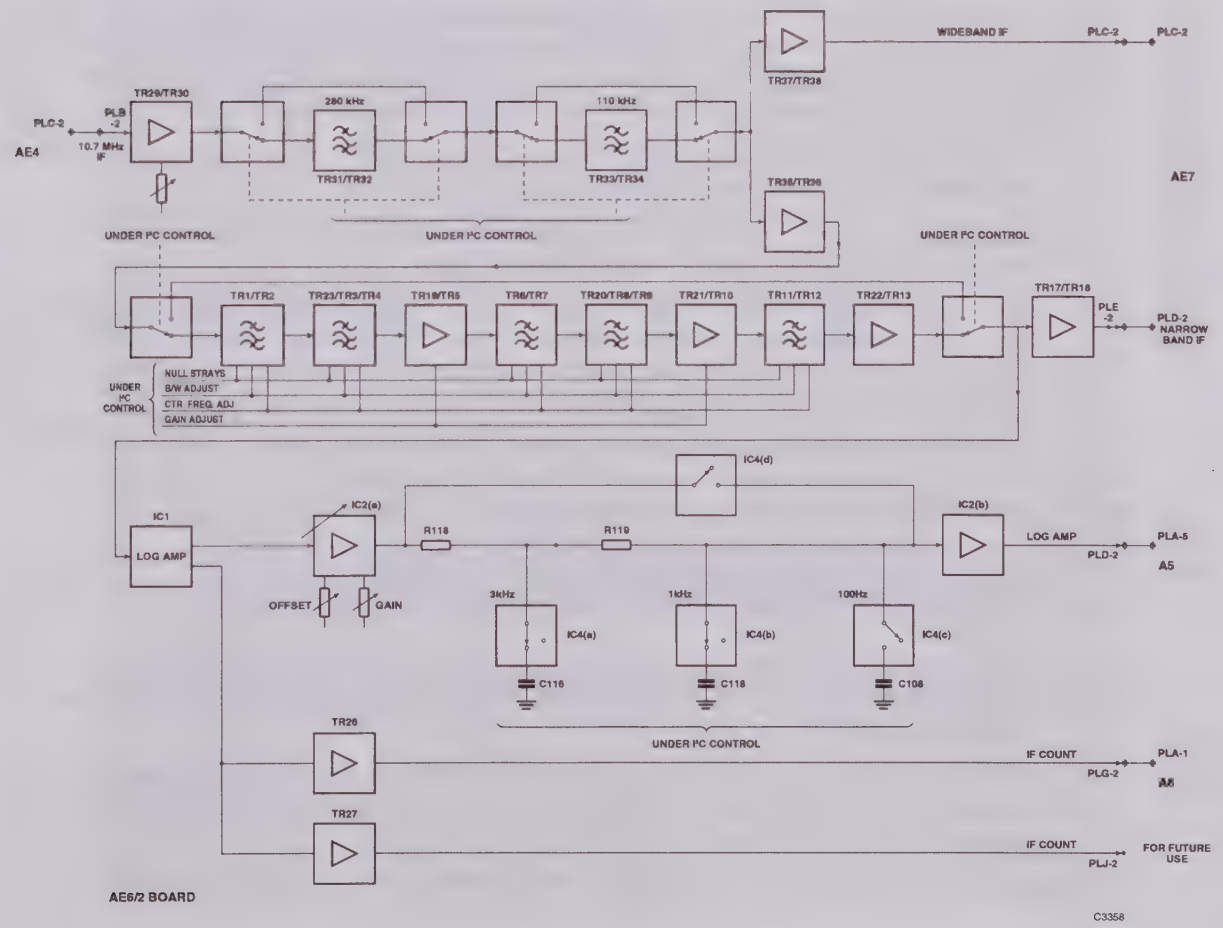

Fig. 1-12 AE6/2 board - block diagram

With both filters switched into circuit, the wideband filter provides a pass band of 100 kHz with increased isolation.

Each of the two wideband filters uses the same technique, so only one is described. XL6 is a ceramic band-pass filter centred on 10.7 MHz. To compensate for the loss in the filter, the signal is first amplified by TR31. Matching for the ceramic filter is provided by R161 and R164. TR32 buffers the filter output.

Following the two wideband filter sections, TR35 and TR36 provide a fixed gain of 24 dB (21 dB), raising the nominal signal level to the crystal filter to +7 dBm (+4 dBm), while TR37 and TR38 raise the nominal signal level to the AE7 board to 0 dBm.

Crystal filter control (sheet 1)

The paired outputs of DAC IC16 are summed and scaled by IC14 and IC15 to provide high resolution dynamic control of centre frequency, null strays, bandwidth adjust and gain adjust. The MSB provides coarse control, and the LSB fine control of the crystal filter parameters.

Variable-bandwidth crystal filters (AE6: sheets 2 and 3; AE6/2: sheets 2 to 4)

The five stages of the crystal filter are cascaded to approximate to a Gaussian filter. Each stage is the same, so only the first stage is described.

C4, C5 and varactor D9 are in series with the crystal XL1. The centre frequency can be initially adjusted by the variable capacitor C4, and dynamically adjusted by the bias voltage applied to D9. The range of control of CENTRE FREQ ADJUST on D9 is between 0 V to +10 V which is generated under software control by IC14(a) and IC15(a). The bandwidth is adjusted by varying the conductance of D1 and D23 (control line BANDWIDTH ADJUST), which effectively alters the resistive component of the filter and thus its Q factor.

At bandwidths greater than 10 kHz, the stray capacitances across D1 and D23 become significant and contribute to detuning the crystal. To compensate for this, the parallel-tuned circuit L2, C13, C14 and D10 permits the effect of the strays to be nulled, both initially by C13, and dynamically by NULL STRAYS under software control by adjusting the capacitance of varactor D10.

The effect of crystal mounting capacitance on the response skirt is nulled by applying an antiphase signal via TR2 and C7 to the output side of the crystal.

Emitter-followers TR1, TR23/TR3, TR19, TR6, TR20/TR8, TR21, TR11, and TR22/TR13 provide isolation and impedance matching between stages.

The effect of dynamic bandwidth adjustment is to reduce the overall gain as the bandwidth is increased. To compensate for this, the gain of TR5 and TR10 is adjusted by the software controlled GAIN ADJUST signal and associated pin diodes D3 and D6.

The whole of the crystal filter can be switched out by the XTAL FILTER BYPASS signal, which is applied to the input, R97 on sheet 2, and output, R98 on sheet 4 (sheet 3).

AE6: Log amplifier and video filters (sheet 4)

The log amplifier is of the successive summation type. It uses a chain of identical amplifiers whose outputs successively saturate at a predetermined level. The outputs of all the stages are then summed.

Each of the ICs IC1 to IC8 has a detected output at pin 4, and an RF output at pin 3. The amplifier/detectors IC9 and IC10 provide additional drive to achieve a logarithmic response at high signal levels.

The output at IC8 pin 3, after isolation by the emitter follower TR40 and transformer T1, provides an IF COUNT signal over a wide dynamic input range with a suitable amplitude for counting on the A6 CPU board.

The detector current outputs of all stages are summed by TR26. R141 is adjusted to match the log amplifier's output to the A to D input on the A5 display board to give the correct display dB/div characteristic while R140 positions the trace on the display by applying a DC offset.

Different video filter characteristics are provided by the action of TR27 and TR28. These transistors switch in/out decoupling components under software control. R135/C133 are effective at 3 kHz bandwidth, R136/C134 at 100 Hz and R136/C135 at 1 kHz.

AE6/2: Log amplifier and video filters (sheet 5)

The log amplifier IC1 is an AD606, which contains nine limiting amplifiers in a successive detection arrangement to provide a logarithmic response over a dynamic range of 90 dB. The stable accurate supply voltage of +5 V required by IC1 is provided by an LT1019, IC3.

IC1 has two outputs; an RF signal LI1LO on pin 8 and a DC signal VLOG on pin 6.

The RF output, after buffering by the emitter follower TR26, provides an IF COUNT signal over a wide dynamic input range with a suitable amplitude for counting on the A6 CPU board.

IC2(a), and potentiometers R141 (gain) and R140 (offset), allow the DC output to be adjusted. R141 is used to match the output to the A-D input on the A5 display board to give the correct display dB/div characteristic, while R140 positions the trace on the display by applying a DC offset. When correctly adjusted, input levels between –75 dBm and +5 dBm produce output signals on PLD-2 of between –0.5 V and +2.5 V.

Various video filter characteristics are provided by the filter components R118, R119, C116, C118, and C108, which are switched in or out by IC4(a) to IC4(d). These switches are controlled by bits P3 to P5 from IC17. The following table shows the relevant bit patterns.

P5	P4	P3	Effective Filter
0	0	1	100 Hz
0	0	0	1 kHz
0	1	0	3 kHz
1	1	0	None

AE7 Demodulator board

Circuit diagrams: Fig. 7-138 to 7-140

Introduction

Fig. 1-13 is a block diagram of AE7. The board is supplied with 10.7 MHz wideband and narrowband IF signals from AE6. It has an FM and an AM/SSB channel, but the SSB facility only works in conjunction with the optional AE8 board which mounts on AE7 (**Note:** AE8 is always fitted on the 2966A). The AE7 board provides demodulation and filtering of the FM, AM and (where applicable) SSB signals, and generates DEMOD FM and DEMOD AM signals to A3 audio processor board.

The board supplies an AGC OUT signal to A2 receiving in return a SQUELCH signal. AE7 is controlled via the AE1 I^2C bus.

I^2C control (sheet 1)

The AE1 I^2C bus is decoded by IC1 to provide:-

- SSB ON selection enabling SSB demodulation.
- AGC FAST selection to switch AGC time constants.
- FM LOW GAIN selection to set gain of FM demodulation.

- WIDEBAND SA (spectrum analyzer) FILTER SELECT.
- Selection of required ±7.5 kHz, ±3.75 kHz or ±1.1 kHz crystal filter. These are not normally fitted.

Crystal filters and AGC attenuator (sheet 1)

Switches IC2 and IC3 select the required filter circuit, according to the D0-D3 outputs from IC1. Currently, the filters are unused. However, the WIDEBAND IF signal can be routed directly or through a filter. The NARROW band IF signal cannot be filtered here.

AGC attenuation is provided by PIN diode chain D4-D11, switched by IC4 according to whether or not wideband filter operation is required. For operation from the wideband path IC4 connects the AGC bias to diodes D4-7 whilst D8-11 are biased off via R48 for increased isolation between the two paths. AGC operation is described later. The output from the centre of the diode chain provides the drive for amplifier IC5 which provides antiphase signals to the balanced mixer IC6 (sheet 2). AGC operating level is set by altering the gain of IC5 with R154 (IF GAIN).

Mixer and IF amplifier (sheet 2)

The two 10.7 MHz outputs from IC5 are connected to pins 12 and 13 of double balanced mixer IC6. They are mixed with a 10 MHz signal from AE5 to give the 4th IF signal of 700 kHz. The second channel component is removed from the signal by the low-pass filter L13/L14 and C55/C56/C106 and the signal is amplified by IC7(a). The 700 kHz IF is passed to limiter IC8 and the AM demodulator.

AM/SSB channel

The output of IC7(a) is applied to multiplier IC11 together with the limited 700 kHz from IC8 for AM demodulation. Output from IC11 is fed via IC12(a) and AM GAIN control R116 to an 80 kHz low-pass filter formed by IC12(b)/(d) (sheet 3) and then to the A3 board as DEMOD AM.

The AE8 board, when fitted, allows the AM demodulator to be used for SSB. The 700 kHz BFO signal from AE8, when SSB is on, is applied to IC11 via switch IC16, which inserts this signal as the carrier. Control line SSB ON enables SSB operation.

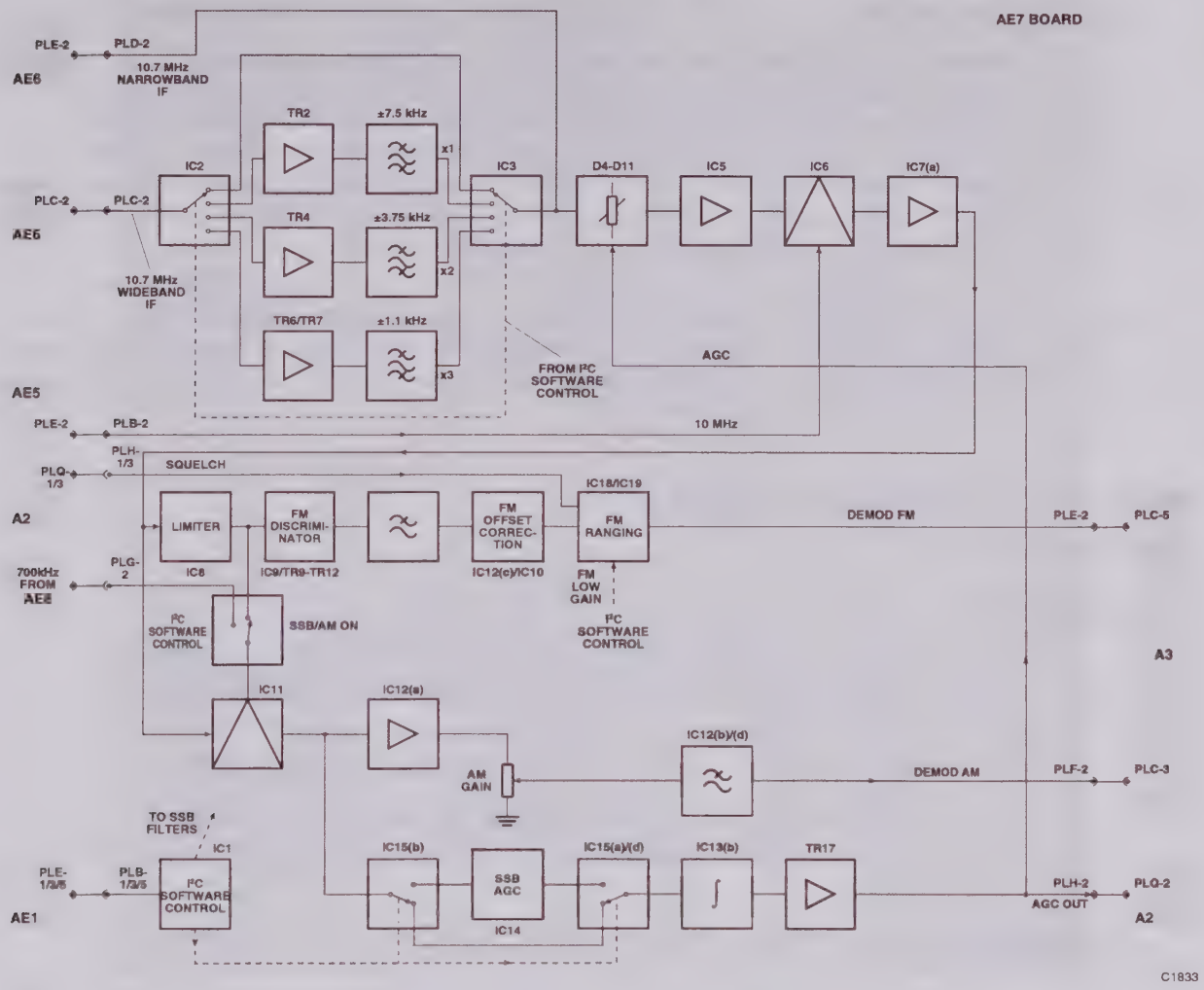

Fig. 1-13 AE7 board - block diagram

FM channel

The output of limiter IC8 (sheet 2) is applied to IC9 which produces differential square wave output signals. These signals are amplified by TR9 and TR10 whose collector outputs are clamped by D22 and D23 to ±6.2 V. TR11 and TR12 are switched by the input signal at 700 kHz, resulting in a differentiated signal at R101/R168 junction, representing the deviation on the FM carrier. L20/L22/L23/L25 and C78/C79/C145/C80/C146 form a low-pass filter to remove the 700 kHz and 1.4MHz content, with R145 providing frequency response adjustment.

IC12(c) (sheet 3), with associated components, forms an adjustable offset voltage source for amplifier IC10. Normal/FM LOW GAIN control is provided by switch IC18 which also provides the means of connecting the SQUELCH signal from the A2 board. Gain may be ×1 or ×10 as referred to in the section on AF, demod and multimeter ranging.

AM and FM AGC (sheet 2)

The push-pull outputs from IC11 are summed by IC13(a). DC content is extracted from the audio signal by C87/R125/R126 and integrated by IC13(b). To increase the current capability of the integrator output it is passed through emitter follower TR17 (sheet 1) before reaching the AGC control diodes.

For AM, a long time constant is required in the integrator, this being provided by C96. When FM is used, AGC FAST deselects C96 with IC15(c) just leaving C168, thus altering the integration time.

SSB AGC (sheet 2)

When SSB ON is selected, the audio signal from IC13(a) is connected to the SSB AGC circuit. This two-way AGC circuit provides a fast-attack/slow-decay AGC characteristic, which is required to handle the typical "bursty" SSB operation. The main AGC path is via IC14(a) and detector D27, with its time constant determined by C53/R158/R138/R136/R137. IC14(b), D28, C84 and associated components constitute a peak detector with a relatively slow response. Under quiescent conditions, C84 is uncharged and IC14(c) holds TR14 off, thus the discharge resistance of C53 in the main AGC path is high (i.e. a long time constant).

When an SSB signal occurs, it is peak detected by D28, and C84 charges. When the charge reaches the threshold set by R134/R135, TR14 is turned on, which switches R137 out of circuit. This shortens the time constant of C53 in the main AGC path. The SSB AGC gain is adjustable by R139, which sets the gain of IC14(d). The output from the SSB AGC circuit then passes to the main AGC integrator via switch IC15(a).

AE8 SSB BFO/Digital systems board

Circuit diagram: Fig. 7-142

Introduction

AE8, when fitted, is mounted on AE7, and forms part of the SSB option for the 2965/65A. It is always present in a 2966A, because the digital systems require a 2.8 MHz signal (see below). It generates the following:-

- A 700 kHz signal that provides a beat frequency for SSB demodulation.
- A 2.8 MHz signal that serves as the sampling frequency for the digital systems.

The board is fed with a 10 MHz reference from AE5, which it routes to AE7, and an SSB ON signal from AE7.

Circuit description

TR1 and associated components form a 2.8 MHz VCO which is phase locked by means of a loop circuit to a reference of 400 kHz produced from the 10 MHz reference by divider IC1. IC1 and the VCO are enabled by the SSB ON signal fed via TR3.

The inputs to phase detector IC2(a)/IC2(b) are the 400 kHz signal from IC1 and the VCO output, divided by 7 by IC7. Its output pulses are fed to loop filter IC4 and filter circuit IC5 which effectively sum the average and integrate the result to produce a DC level that tunes the VCO.

One of the VCO outputs is taken to PLA and the DSC via an attenuator that reduces the signal level to approximately 1 V peak-to-peak. Another clocks a divide-by-4 counter IC8, producing the 700 kHz signal which is attenuated to approximately 700 mV peak-to-peak before being fed to AE7.

AA1, AA1/1 Input switch

Circuit diagrams: AA1 Fig. 7-144, 7-145
AA1/1 Fig. 7-147, 7-148

Introduction

Input switch AA1 sets up the internal RF connections to the N-type and TNC sockets on the front of the test set according to the function selected on the RF SELECT key. The necessary switching is carried out by double coil, latched relays, controlled by the A6 CPU via the I^2C bus. The unit also provides overload indications to A6 and power meter ranging information to power meter AB2.

Relay control and switching configurations

IC1 (sheet 1) controls relay operation, the I^2C signals from the A6 CPU being routed via A7. Relays are driven by relay drivers TR1 to TR6 (sheet 1) and TR7 to TR12 and TR15 to TR16 (sheet 2) via NAND gates. Note that D0 and D3 from IC1 are set lines which are single pulsed by software to operate the required relay coil according to the data on D1-D2 and D4-D7. For example, if D1 is high, RLA coil 7/1 is energized with the set pulse on D0. Although the coil de-energizes at the end of the pulse on D0, the relay contact remains in the same position, and will remain in that position until the other coil 6/1 is energized with D1 at a low and another set pulse.

The relay contacts are shown on sheet 2. Their positions configure the N-type and TNC socket connections to sockets SKC to SKF on AA1, which are connected respectively to signal generator, receiver attenuator, power meter and RF calibration input on A7. Data bits control respective relays as follows:-

D1	Relay A	D2	Relays E-H
D4	Relay B	D5	Relay C
D6	Relay D	D7	Relay J

Available configurations are summarized below:-

Configuration	D1	D2	D4	D5	D6	D7
Duplex Rx to TNC, Sig Gen to N-type	Low	Low	Low	Low	Low	Low
Duplex Rx to N-type, Sig Gen to TNC	Low	High	Low	Low	Low	Low
Duplex on TNC Rx/PwrMtr/Sig Gen to TNC	High	Low	High	Low	High	Low
Duplex on N-type Rx/Pwr Mtr/Sig Gen to N-type	High	High	High	Low	High	Low
Pwr Mtr to TNC Rx/Pwr Mtr to TNC, Sig Gen to N-type	Low	Low	High	High	High	Low
Pwr Mtr to N-type Rx/Pwr Mtr to N-type, Sig Gen to TNC	Low	High	High	High	High	Low
Pwr Mtr Calibrate Pwr Mtr to 10MHz input	Low	Low	Low	Low	Low	High
Calibrate Sig Gen to Pwr Mtr	High	High	High	Low	High	Low

Overload detect circuits (sheet 1)

If an overload occurs on the TNC or N-type sockets, the OVERLOAD TNC or OVERLOAD N-TYPE lines to IC2 are driven low. The overload can be detected by the A6 CPU reading the state of IC2 D0 or D1 over the I^2C bus. A direct indication is also given to the A6 CPU (via A7) by the RFOV_L interrupt line being asserted.

N-type overload is detected by monitoring the temperature of the 20 dB power load using a thermistor. This is connected via PLE to comparator IC3(a) which when gated via IC4(a) and IC4(c) switches relays RLE and RLG so that the signal is no longer connected. The output of IC3(a) also passes to IC2 D1.

For TNC input overload, the RF level is detected by D1-4 on sheet 1 after passing through the attenuator formed by R40/41, R69/70 on sheet 2. The detected level is compared with references set by R45/46, resetting flip-flop IC13(a) when a fault occurs. IC13(a) then switches RLF and RLH to safe positions and indicates the overload to IC2 D0. The flip-flop is set again by pulsing the relays again.

Power meter ranging

IC2 (sheet 2) provides POWER METER GAIN RANGE and POWER METER GAIN signals to the AB2 power meter via PLB, controlled from the I^2C bus.

AB2 Power meter

Circuit diagram: Fig. 7-150

The input to the AB2 power meter comes via PLA from AB1, which is a module that plugs into AB2. Basically, AB1 consists of a Seebeck power sensor which senses RF and produces a DC voltage proportional to RMS power. This DC voltage is chopped by a circuit on the AB1 that is supplied with the approx 200 Hz SWITCH DRIVE signal from the reference frequency generator IC9 on AB2. After chopping, the signal from AB1 is applied to AB2 in the form of anti-phase square waves VIN1 and VIN2.

The two anti-phase square waves are passed through a two balanced amplifiers formed by IC1, IC2 and IC3. Thermistor R65 provides temperature compensation for the Seebeck power sensor, adjusting the amplifier gain according to temperature.

The 1st and 2nd attenuator switches IC4 and IC6 are dual, 4-channel multiplexers. Each half of each IC is fed with four different signal levels from attenuation chains R21-7 and R35-41. Channel selection and hence attenuation level for IC4 and IC6 is determined by the address data on lines A0 and A1 which are the POWER METER GAIN RANGE and POWER METER GAIN signals described in the AA1 switch description.

IC4 enabling is controlled by a spike blanking circuit, comprising IC11 and associated components, which are arranged as a monostable. This circuit disables IC4 for a short period on the input waveform edges, thus eliminating spikes that may be present on the low level output of the Seebeck sensor.

The signals also pass through a third amplifier IC5 between the two attenuators and a fourth IC7 after them.

The differential to single ended conversion and synchronous detector stages produce a DC level which is the RF POWER signal to the A5 display.

The approximate gains of the amplifier stages are:-

1st amp	23.1
2nd amp	9.3
3rd amp	18.5
4th amp	18.5

The attenuator settings and nominal overall amplifier gain for each switch address are:-

Switch A1	Switch A0	1st Attenuator	2nd Attenuator	Overall gain
Low	Low	×0.008	×0.008	4.7
Low	High	×0.04	×0.04	117
High	Low	×0.2	×0.2	2928
High	High	×1	×1	73200

AB3 Mixer module board

Circuit diagram: Fig. 7-152

Introduction

The AB3 mixer module provides several facilities:-

- A straight-through path from the test set signal generator output amplifier (AF5) to the step attenuator for standard operation.
- A double-balanced mixer to mix the digital systems IF from A8 with the test set signal generator output. The output from the mixer is routed to the step attenuator for output to a radio receiver.
- An I^2C interface to control the switching paths.

Switching paths

Switching paths are provided for:-

- Standard (i.e. analog) test set operation.
- Digital systems operation.

The switching configurations are shown in Figs. 1-14 and 1-15 respectively.

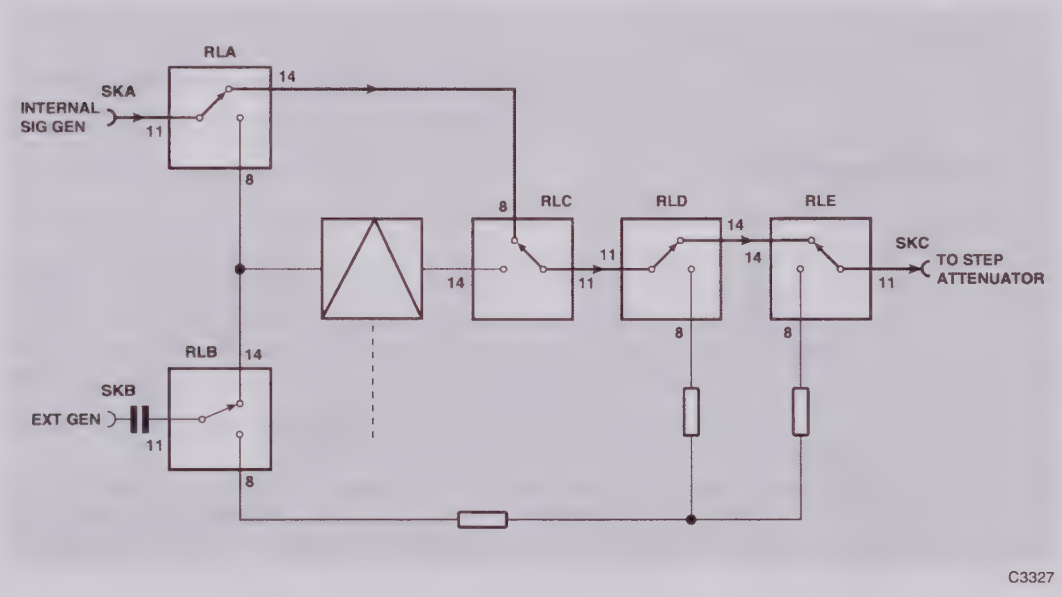

Fig. 1-14 AB3 switching paths - analog operation

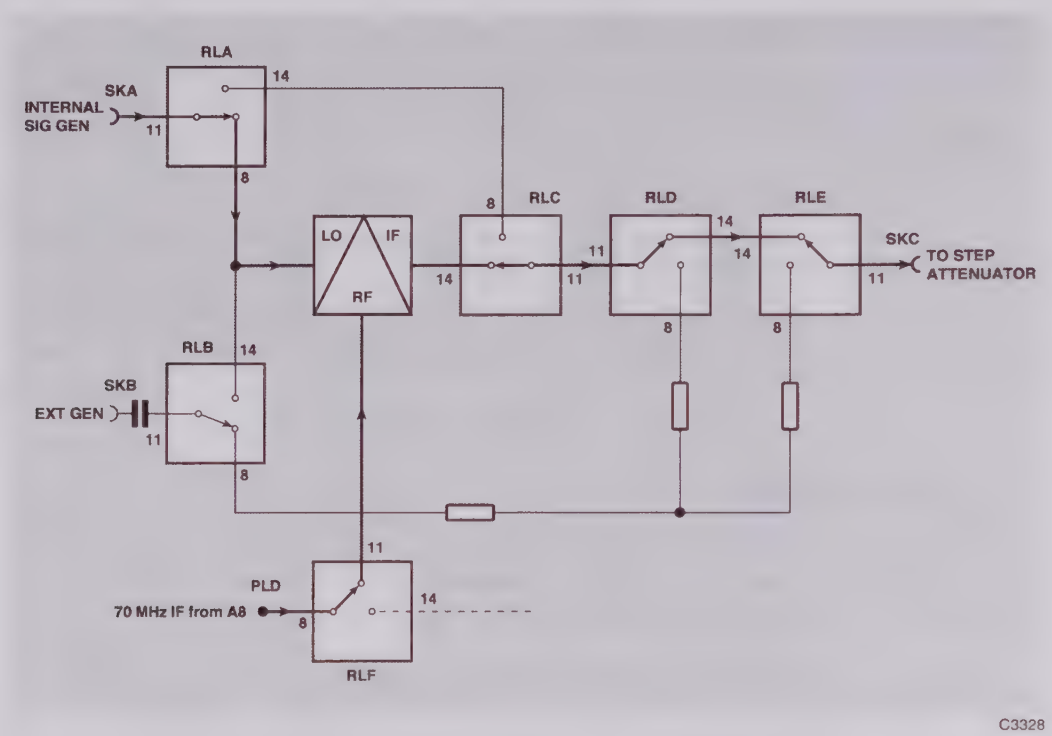

Fig. 1-15 AB3 switching paths - digital systems operation

Circuit description

I²C interface

The I²C bus enters the mixer module box via Filtercons. It is connected to the mixer module board via connector PLA, pins 1 (serial data - SDA) and 2 (serial clock - SCL). These two signals are routed to IC1. IC1 address pin A0 is pulled high by R54, and address pins A1 and A2 are pulled low by R55 and R56 respectively, to set the I²C bus address to 72Hex.

IC1 provides a decoder that controls relays to set the switching path for the appropriate operation. Its outputs, D0 to D7, provide the following functions:-

	Output State		Analog	Digital
	High	Low		
D7	N/C	N/C	*X*	*X*
D6	Enable RLD to F	Disable RLD to F	H	H
D5	RLF 11>14	RLF 11>8	H	L
D4	RLD, RLE 11>14	RLD, RLE 11>8	H	H
D3	RLC 11>14	RLC 11>8	L	H
D2	RLB 11>14	RLB 11>8	H	L
D1	RLA 11>14	RLA 11>8	H	L
D0	Enable RLA to C	Disable RLA to C	H	H
Hex code			77H	59H

Notes

The numbers 8, 11 and 14 above are pin numbers on the relay packages. For example, RLF 11>14 signifies a connection between RLF pins 11 and 14.

The relays used in the mixer module are of a latching type. If the appropriate relay is enabled (D0 or D6 at logic high), then that relay will be set to the state dictated by D1, 2, 3, 4 or 5, as appropriate (logic high connects pin 11 to pin 14; logic low connects pin 11 to pin 8). If the relay is disabled (D0 or D6 at logic low), then the relay will remain unchanged from the last enabled transition.

To change the state of the relays for analog mode, I^2C data 77H is sent, followed immediately by 36H (i.e. the same code except that the relay enable bits are low). Similarly, to change to digital systems mode, I^2C data 59H is sent, followed immediately by 18H. In each case, the second byte ensures that the relay enable is removed before the relay code.

Relay control

Each of the relays RLA, B, C, and F has two drivers; one to set the contact to connect pins 11 and 14 (drives relay pin 6), the other to connect pins 11 and 8 (drives relay pin 7). relays D and E share their drivers as they are activated in unison. Each driver has:-

- A 74HC00 NAND gate, to NAND the enable bit with the relay control bit.
- A BCX17 pnp transistor (with bias resistors driven by the NAND gate) to pull the relay pin (6 or 7) to +5 V.
- A BAS16 catch diode across the relay coil, to prevent back EMF appearing on the transistor collector.
- A 10 nF decoupler near the transistor collector.
- A 220 pF decoupler near the relay.

The drivers for relay pin 7 have the relay control bit inverted, to provide the opposite function.

The circuit elements used for each of the above functions are summarised as follows:-

	INV	NAND	Bias R	TR	D	10 nF	220 pF
RLA pin 6	–	IC3(a)	R5(a), (b)	TR1	D1	C4	C14
RLA pin 7	IC6(a)	IC3(b)	R5(e), (f)	TR2	D2	C5	C15
RLB pin 6	–	IC3(c)	R5(g), (h)	TR3	D3	C6	C16
RLB pin 7	IC6(b)	IC3(d)	R5(c), (d)	TR4	D4	C7	C17
RLC pin 6	–	IC4(a)	R6(a), (b)	TR5	D5	C8	C18
RLC pin 7	IC6(c)	IC4(b)	R6(e), (f)	TR6	D6	C9	C19
RLD, E pin 6	–	IC4(c)	R7, 8	TR7	D7	C10	C20, 21
RLD, E pin 7	IC6(d)	IC4(d)	R9, 10	TR8	D8	C11	C22, 23
RLF pin 6	–	IC5(a)	R6(g), (h)	TR9	D9	C12	C24
RLF pin 7	IC6(e)	IC5(b)	R6(c), (d)	TR10	D10	C13	C25

Analog mode

In this mode, the test set signal generator output from AF5 is routed from SKA to the step attenuator via RLA, RLC, RLD, RLE, and SKC.

Digital systems mode

In this mode, the IF signal from board A8 is mixed with the test set signal generator output, as explained below.

Double-balanced mixer

The double-balanced mixer IC7 is a Mini-Circuits LMX-149 device. It is currently only used in digital systems mode, so this description applies to its use in that mode.

The test set signal generator output (nominal level 13 dBm) is routed via RLA to the LO mixer port. The other input to the mixer is the 70 MHz IF signal from board A8, which is routed to the mixer RF port via RLF.

The LO frequency should be set to the required digital systems channel plus 70 MHz (the A8 frequency). The mixer then provides an output at the required digital systems channel frequency.

The output from the mixer IF port is routed to the step attenuator via RLC, RLD, RLE, and SKC. Being DC coupled, the mixer IF port is able to cater for the broad bandwidth of this output (the user frequency range is 100 kHz to 1.156 GHz).

The 3 dB pad R46 to R48 improves the mixer LO port VSWR to approximately 1.8. The 3 dB pad R49 to R51 and R69 performs a similar function for the mixer IF port.

IF amplifier and filter

The IF amplifier and filter is not used.

Power supplies

Power comes into the mixer module box via Filtercons and is connected to PLA pin 4 (+12 V) and pin 5 (+5 V). The rails are filtered by L1, C44 and C45 (+12 V); and L2, C46 and C47 (+5 V).

AF1 104.86MHz VCXO and PLL board

Circuit diagram: Fig. 7-154

Introduction

AF1 generates 6.5536 MHz, 2.097153 MHz and 419.4304 MHz signals locked to the 10 MHz reference frequency from AR1. The 6.5536 MHz signal is routed to the A5 display board. 2.097153 MHz signals are routed to AF2, AE1 and AE2. The 419.4304 MHz signal, when present, is fed to the AF5 board.

Voltage-controlled crystal oscillator (VCXO)

TR1 operates as a tuned collector tuned emitter crystal controlled oscillator. The crystal is shunted by L1 in series with C2 and the varactor diode D1. The voltage applied to D1 permits the frequency and phase of oscillation to be adjusted about the resonant frequency of the third overtone crystal XL1. TR2 isolates the VCXO and provides a low impedance output drive for the three succeeding signal paths.

Phase locked loop

The 10 MHz reference from AR1 is divided by 10 to provide a 1 MHz reference for the phase locked loop, which comprises the VCXO TR3, divider IC1/IC2, phase detector IC3(a)/IC4(a)-(c)/IC3(b) and loop filtering IC5(a)/(b).

The digital divider IC1 and programmed EPLD IC2 form a fractional-N divider circuit dividing the 104.8576 MHz oscillator output, buffered by TR3, producing a 1 MHz phase/frequency reference used to clock IC3(a). Pulses are generated by the phase detector whose width is determined by the phase difference between IC2 and IC6 outputs at the junction of diodes D3 and D5.

Filter IC5(a) sets the PLL loop bandwidth to 10 Hz, and the 100 Hz low-pass filter IC5(b) further prevents the introduction of spurious interference to the VCXO via the varactor control voltage.

6.5536 MHz signal path

After amplification by TR4, the VCXO output signal is divided by 16 in IC7. The resulting 6.5536 MHz signal is fed to the A5 display board.

419.4304 MHz signal path

Note that this signal is not always present. It is switched on by the DOUBLER ON signal from AF5 which switches on TR11 providing the +4.7 V LC power supply to TR8 and TR9.

Emitter follower TR7 is a high impedance load to the VCXO circuit. Amplifier TR8 generates the necessary drive for frequency doubler circuit D7 and D8. L11/12 and C40/41 match the output of the doubler to amplifier TR9 which drives the second doubler. The 419.43 MHz signal is then amplified by IC11 and conditioned by low-pass filter C48/L20/C69 and band-pass filter L18. It is connected to the AF5 board where it is used as a local oscillator for mixing with the main signal generator oscillators when low frequency signal generation (100 kHz to 36 MHz) is required.

2.097152 MHz signal path

After amplification by TR5 and TR6, the 104.8576 MHz VCXO output is divided by 50 in IC8 and IC9 to provide a 2.097152 MHz signal source for AF2, AE1 and AE2 boards after buffering by IC(b)-(e).

Power line cleaning and isolation

The −12 V line cleaner circuit based on IC12(a) and TR10 prevents noise on the VCXO supply which might cause the VCXO to generate phase noise.

The inverted input of IC12(a) is biased by the potential divider R52, R51 and R53, with the non-inverted input maintained at an AC earth via the long time constant R53 and C50. Any high frequency current transients on the power line are developed across R57 and applied via zener diode D12 to the non-inverted input of IC12(a). The output of IC12(a) drives the base of TR1 to compensate for the transient current change.

AF2 and AF3 RF oscillator and VCO boards

Circuit diagrams: Fig. 7-156 (AF2 earlier version) or 7-158 (AF2 later version), and 7-160

Introduction

The AF2 and AF3 boards interact with the AE1 fractional-N control board in generating signals of frequency determined by the front panel settings. The output has a frequency range of 576 MHz to 1150 MHz in 1 Hz increments, and can be frequency or phase modulated using an AF source from the A1 board. Operation is controlled from the A6 CPU via the AE1 board and its I^2C bus.

AF3 is contained in a metal enclosure mounted on the AF2 board.

Fig. 1-16 is a block diagram showing the main circuitry on the two boards and the interconnections with related circuits on other boards.

Fractional-N control

The main elements of the fractional-N control are shown in Fig. 1-16. These include the phase detector, three oscillators and the ÷2 circuit IC9 on AF2, and the signal generator and programmable divider on AE1. Note also that the circuit uses a 2.09752 MHz reference from AF1. The 1-bit ADC circuit on AE1 has already been described, its function being to apply low-frequency modulation to the fractional-N signal when required.

Fractional-N control employs a complex algorithm which successively divides the oscillator output by 2^n and 2^{n+1} to provide a feedback signal which, when phase compared with a fixed reference frequency, produces an error signal to adjust the oscillator to the required frequency.

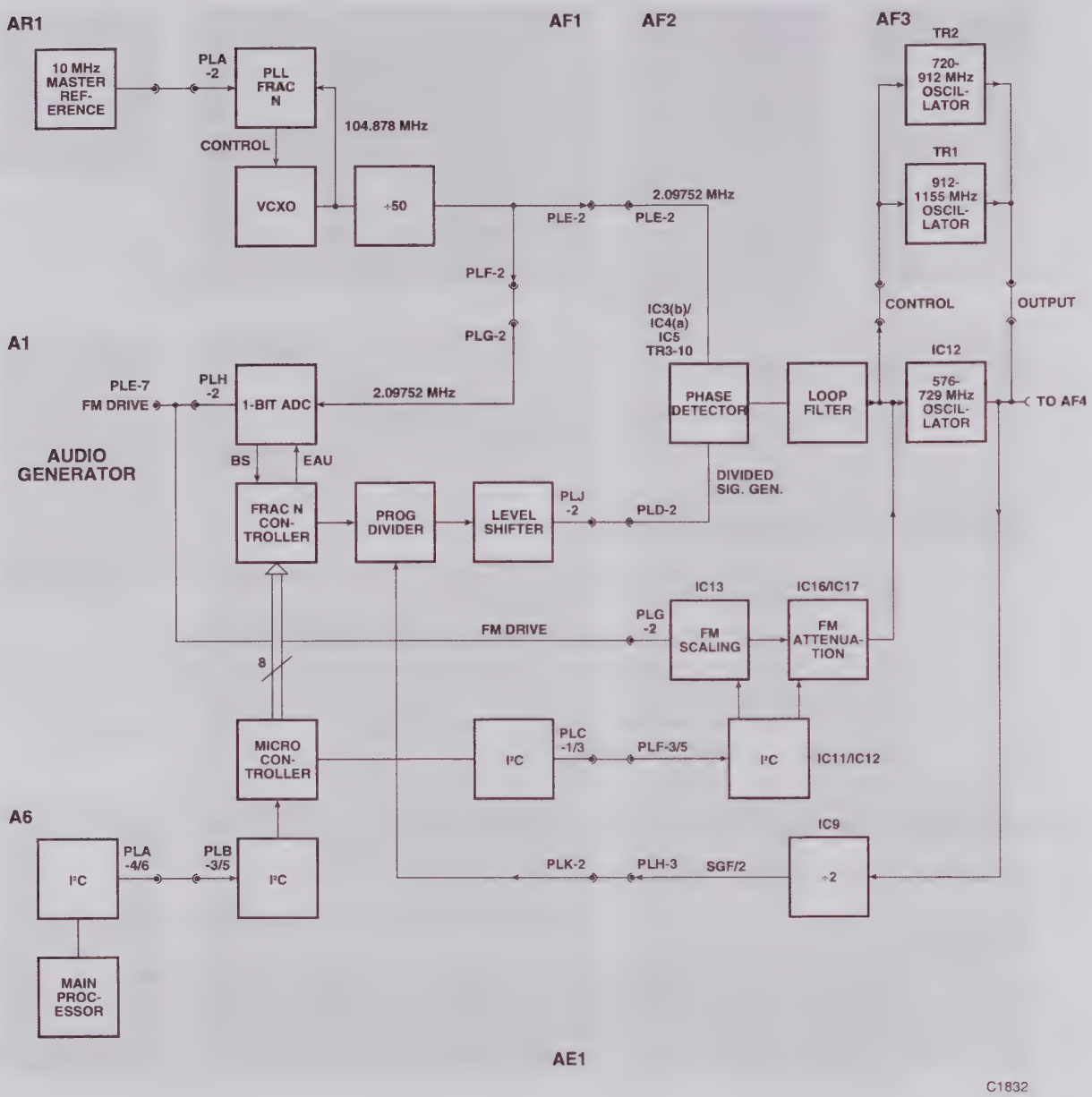

Fig. 1-16 Block diagram of AF2, AF3, and associated boards

Oscillators

The frequency range 576 MHz to 1150 MHz is covered by three VCOs, one on AF2 and two on AF3. Each VCO is in the fractional-N control loop of which the signal generation circuits on AE1 form part. The required VCO is selected from the I^2C bus decoded by IC12 and switched by IC6 according to the LOW (L), MED (L) and HIGH (L) signals to connect the -12 V line to the appropriate VCO.

The three oscillator circuits are similar, each comprising a common-emitter Hartley circuit, with a varactor diode forming part of the capacitive coupling between the inductors.

Oscillator ranges are as follows:-

LOW	576 MHz to 720 MHz
MED	720 MHz to 912 MHz
HIGH	912 MHz to 1150 MHz

The signal from the appropriate oscillator is fed to common-base amplifiers TR13, TR14 before passing to AF4 via amplifier IC7 at a level of +2 dBm. TR14 and IC8 amplify the oscillator signal to drive ÷2 IC9. IC10 amplifies the resultant signal to a level of +4 dBm before it is passed to AE1 board as SGF/2. After fractional-N division on AE1, the signal DIVIDED SIG GEN is returned to the phase detector circuit on AF2 via PLD.

Phase detector

IC5(a) and IC5(b) outputs are antiphase square waves which cause TR3 and TR8 to conduct alternately. When TR3 is on, TR6 and TR7 are also on and current flows into C18. Similarly, when TR8 is switched on, TR6 and TR7 are held off, TR4 and TR5 are on, and current flows into C17. The ratio of these charges varies as the mark/space ratio of IC5(a) and IC5(b) outputs varies. TR5 and TR6 collector voltages are applied to TR10 and TR9, whose common collector voltage controls the selected VCO frequency. When the fractional-N control loop is phase locked, IC5(a) and IC5(b) outputs have an equal mark/space ratio, the charges are equal and TR9/TR10 collector voltage is such that the VCO frequency is held. If an imbalance occurs, the charges will differ and TR9/TR10 collector voltage will change, moving the VCO frequency towards lock again.

The filters in the collector circuits of TR5 and TR6 remove the fractional sidebands outside the loop bandwidth and also the reference frequency signals which would otherwise appear on the varactor drive line and modulate the oscillator.

TR11 and D8 form a voltage clamp to prevent the varactor voltage falling below +1 V and hence avoiding forward biasing of the varactor diode.

The loop filter formed by components C23, C24, R37, R38 and R39 gives a loop bandwidth of approximately 2 kHz or 7 kHz on later units, permitting narrow-band FM to be modulated via the fractional-N signal generator.

FM/PM modulation

The FM/PM signal from the A1 board is applied to AE1 and AF2. AE1 handles the modulation of low frequencies, AF2 the modulation of high frequencies. This dual FM and PM is complementary through the high-pass characteristic of the AF2 board's fractional-N loop filter bandwidth, and the low-pass characteristic of the AE1 board's 1-bit ADC operating in association with the fractional-N signal generator. Though a notional crossover occurs at about 2 kHz, the transition occurs between 1 kHz (below which the AF2 modulation ceases to occur) and 10 kHz (above which the 1-bit ADC modulation ceases to occur). This crossover area is critical if deviation is to remain constant over the modulating frequency range, and software-controlled compensation for gain errors is applied during the FM deviation calibration procedure.

The range of the FM/PM signal is between 1 V RMS and 0.7071 V RMS (3 dB down on 1 V RMS). The same 3 dB range of this signal is used for all frequency deviations, and 3 dB step attenuation is applied by software increments to the AF2 board's DAC attenuators (effective at the higher modulation frequencies) and by software increments to the AE1 board's fractional-N signal generator (effective at the lower modulation frequencies). The overall effect is to provide seamless attenuation of the 1 V RMS level from 0 dB to 99 dB, corresponding to FM deviation frequencies between 925.500 kHz and 0 Hz.

FM scaling and attenuation circuitry is controlled via I^2C expander chips IC11 and IC12 and switches IC16 and IC17. For function select codes and related VCO and FM/PM attenuation selection, refer to the next section on I^2C control.

The 3 dB steps from 0 dB to 99 dB are constructed using appropriate connection of the FM attenuators via IC16/IC17 together with the 1 dB incremental setting of the A channel of dual channel, 8-bit, multiplying DAC IC13, via IC11. Note that channel B of IC13 is used for calibration only.

IC14 and IC15 are summing amplifiers enabling channels A and B of IC13 to be operated as programmable attenuators. The FM attenuator circuit, centred on switches IC16 and IC17 provides 0 to 80 dB attenuation in 20 dB steps via the I²C bus and IC12. IC18 and IC19 buffer the attenuator switch outputs. The modulating signal is applied to the fractional-N loop filter via the fixed attenuator R73/R39.

I²C control

Control of the various functions of the AF2 board is exercised via the I²C bus using two expanders IC11 and IC12. IC11 is used to select the incremental steps of channels A and B of DAC IC13, described previously. IC12 selects VCO, FM attenuation and DAC channel according to the following codes:-

Function	P7	P6	P5	P4	P3	P2	P1	P0
Low freq VCO on	X	X	X	X	X	High	High	Low
Medium freq VCO on	X	X	X	X	X	High	Low	High
High freq VCO on	X	X	X	X	X	Low	High	High
0 dB FM attenuation	X	X	Low	Low	Low	X	X	X
20 dB FM attenuation	X	X	Low	Low	High	X	X	X
40 dB FM attenuation	X	X	Low	High	Low	X	X	X
60 dB FM attenuation	X	X	High	Low	High	X	X	X
80 dB FM attenuation	X	X	High	High	Low	X	X	X
IC11 output to DAC B	High	Low	X	X	X	X	X	X
IC11 output to DAC A	Low	Low	X	X	X	X	X	X

Note: X means that the level is not important.

Power line cleaning

Any noise on the supply rails with frequency components greater than the loop bandwidth of the F/N loop (2 kHz) will induce phase noise on oscillator output.

The +32 V power line is used by IC1 to derive the +26 V regulated supply for this board. The regulator adjust pin of IC1 is decoupled by C3 to improve ripple rejection. Diode D1 provides a discharge path for C4 on power-down.

Both ±12 V lines are provided with additional protection from noise and ripple when used in sensitive areas of the oscillator and phase detector, using line-cleaner circuits IC2(a), TR1 and IC2(b), TR2. The two line-cleaner circuits are similar and only the +12 V circuit is described.

The invert input of IC2(a) is biased by the potential divider R4, R5 and R9, with the input maintained at an AC earth via the long time constant R6 and C7. Any high frequency current transients on the power line are developed across R3 and applied via zener diode D2 to the non-invert input of IC2(a). IC2(a) output drives the base of TR1 to compensate for the transient current change in the power supply.

AF4 RF divider board

Circuit diagram: Fig. 7-162

Introduction

This board selectively filters the 576 MHz to 1150 MHz signal from the AF2 board and provides frequency division, as required, under control of I^2C bus signals from AE1. The output is fed to AF5 and is within one of the following frequency ranges:-

576 MHz to 1150 MHz	(fundamental)
288 MHz to 576 MHz	(÷2)
144 MHz to 288 MHz	(÷4)
72 MHz to 144 MHz	(÷8)
36 MHz to 72 MHz	(÷16)

Control circuits

Control is via I^2C expander IC1 and 4 to 16 line decoder IC3. These ICs control the state of a series of control signals, i.e., S1 and S0 for setting the divide factor of programmable divider IC7, and V1 to V15 for configuring the filter switch matrix.

The filter selection range determines which and how many low-pass filters are switched in by the various switching diodes. As the divide factor is increased, so the number of filters used increases. Thus, at the top of the range, only one is used, whereas at the bottom, five are used.

Divider and filter selection codes and main controls are summarized in the tables below. These tables can be used to work out the filter switching. However, for guidance, switching control for the first three filter selection ranges is described. For the remaining ranges, the filters used are merely listed.

Range (MHz)	P7	P6	P5	P4	P3	P2	P1	P0
800-1150	1	1	1	1	0	0	0	0
576-800	1	1	1	1	0	0	0	1
400-576	0	1	1	1	0	0	1	0
288-400	0	1	1	1	0	0	1	1
200-288	1	0	1	1	0	1	0	0
144-200	1	0	1	1	0	1	0	1
100-144	1	1	0	1	0	1	1	0
72-100	1	1	0	1	0	1	1	1
50-72	1	1	1	0	1	0	0	0
36-50	1	1	1	0	1	0	0	1

Note: 0 = logic low, 1 = logic high.

Range (MHz)	S1	S0	÷ by	V 1	V 2	V 3	V 4	V 5	V 6	V 6 '	V 7	V 8	V 9	V 1 0	V 1 1	V 1 2	V 1 3	V 1 4	V 1 5
800-1150	X	X	----	N	P	P	P	P	P	1	P	P	P	P	P	P	P	P	P
576-800	X	X	----	P	N	P	P	P	P	1	P	P	P	P	P	P	P	P	P
400-576	0	0	2	P	P	N	N	P	N	0	P	P	P	P	P	P	P	P	P
288-400	0	0	2	P	P	N	P	N	N	0	P	P	P	P	P	P	P	P	P
200-288	0	1	4	P	P	P	P	P	N	0	N	N	P	P	P	P	P	P	P
144-200	0	1	4	P	P	P	P	P	N	0	N	P	N	P	P	P	P	P	P
100-144	1	0	8	P	P	P	P	P	N	0	P	P	P	N	N	P	P	P	P
72-100	1	0	8	P	P	P	P	P	N	0	P	P	P	N	P	N	P	P	P
50-72	1	1	16	P	P	P	P	P	N	0	P	P	P	P	P	P	N	N	P
36-50	1	1	16	P	P	P	P	P	N	0	P	P	P	P	P	P	N	P	N

Note: 0 = logic low, 1 = logic high, N = –12 V, P = +12 V.

800 MHz to 1150 MHz

Here the input signal is undivided and only the 1150 MHz filter is switched in.

The state of the relevant signals is:-

- V1 (IC4 pin 1) at –12 V because IC3 Y0 output is low (address 0).
- V2 at +12 V.
- V6' at logic high.
- V6 at +12 V.

Divider IC7 is disabled by V6' switching on TR1. D1 is reverse-biased by V6, isolating the input from the divider. Since the divider is disabled, the state of S0 and S1 is irrelevant.

The amplified input from IC9 is switched to the 1150 MHz filter input by V1 which forward biases D2, D6 and D49. The 1150 MHz filter output is switched to the board output by D9 and D53 which are also forward-biased by V1. This through path is isolated from the rest of the switching matrix by D5,D10,D12, D14 and D50, reverse-biased by V2 which also forward biases D11,D15-17, and D13 which is reverse-biased by V6.

576 MHz to 800 MHz

Here the input signal is undivided and only the 800 MHz filter is switched in.

The state of the relevant signals is:-

- V2 at –12 V because IC3 Y1 output is low (address 1).
- V1 at +12 V.
- V6' at TTL high.
- V6 at +12 V.

Divider IC7 is disabled, as described previously, and the states of S0 and S1 are irrelevant.

The amplified input from IC9 is switched through the 800 MHz filter by V2 which forward biases D2, D5, D50, D14, D12 and D10. D6, D49, D53 and D9 are reverse-biased by V1, isolating the 1150 MHz filter. D13 is reverse-biased by V6, isolating the other filters.

400 MHz to 576 MHz

On this and all lower frequency ranges, the divider is used. V6' is at TTL low switching off TR1, and V6 is at –12 V, switching the input to the divider via D1. The output of the 575 MHz filter is always switched to the board output on these ranges because V6 forward biases D13 and D10. On these ranges TR3 is cut off, allowing the output of the divider to be applied to TR2 which, with its associated components, forms a compensation amplifier that flattens the frequency response of the divider. The divide factor is dependent on S0 and S1.

On this range, the 575 MHz filter only is switched in. The state of the relevant signals is:-

- V3 and V4 at –12 V.
- V5, V7, V10 and V13 at +12 V.
- S0 low, S1 low (divide factor 2).

D20 is forward-biased by V3, but D23 and D25 are reverse-biased by V5, isolating the 400 MHz filter. D22 and D39 are forward-biased by V4, so the signal path is switched to the 575 MHz filter. V7, V10 and V13 isolate the signal input paths to the lower frequency filters.

288 MHz to 400 MHz

On this range, the 400 MHz and 575 MHz filters are switched in.

200 MHz to 288 MHz

On this range, the 288 MHz and 575 MHz filters are switched in.

144 MHz to 200 MHz

On this range, the 200 MHz, 288 MHz and 575 MHz filters are switched in.

100 MHz to 144 MHz

On this range, the 144 MHz, 288 MHz and 575 MHz filters are switched in.

72 MHz to 100 MHz

On this range, the 100 MHz, 144 MHz, 288 MHz and 575 MHz filters are switched in.

50 MHz to 72 MHz

On this range, the 72 MHz, 144 MHz, 288 MHz and 575 MHz filters are switched in.

36 MHz to 50 MHz

On this range, the 50 MHz, 72 MHz, 144 MHz, 288 MHz and 575 MHz filters are switched in.

AF5 RF output board

Circuit diagram: Fig. 7-164

Introduction

AF5 produces an output to the signal generator attenuator in the range 100 kHz to 1155 MHz, applying levelling and amplitude modulation, as required. It is I^2C bus controlled from the AE1 board. A block diagram is shown in Fig. 1-17.

The board is fed with the 36 MHz to 1150 MHz signal from AF4 and the 419.43 MHz signal from AF1. The latter is switched on by a DOUBLER ON signal sent from AF5 to AF1, and is used to produce outputs in the range 100 kHz to 36 MHz using a mixer stage. There are two signal paths, one for 36 MHz to 1150 MHz and the other for 100 kHz to 36 MHz, selection being controlled by switching diodes.

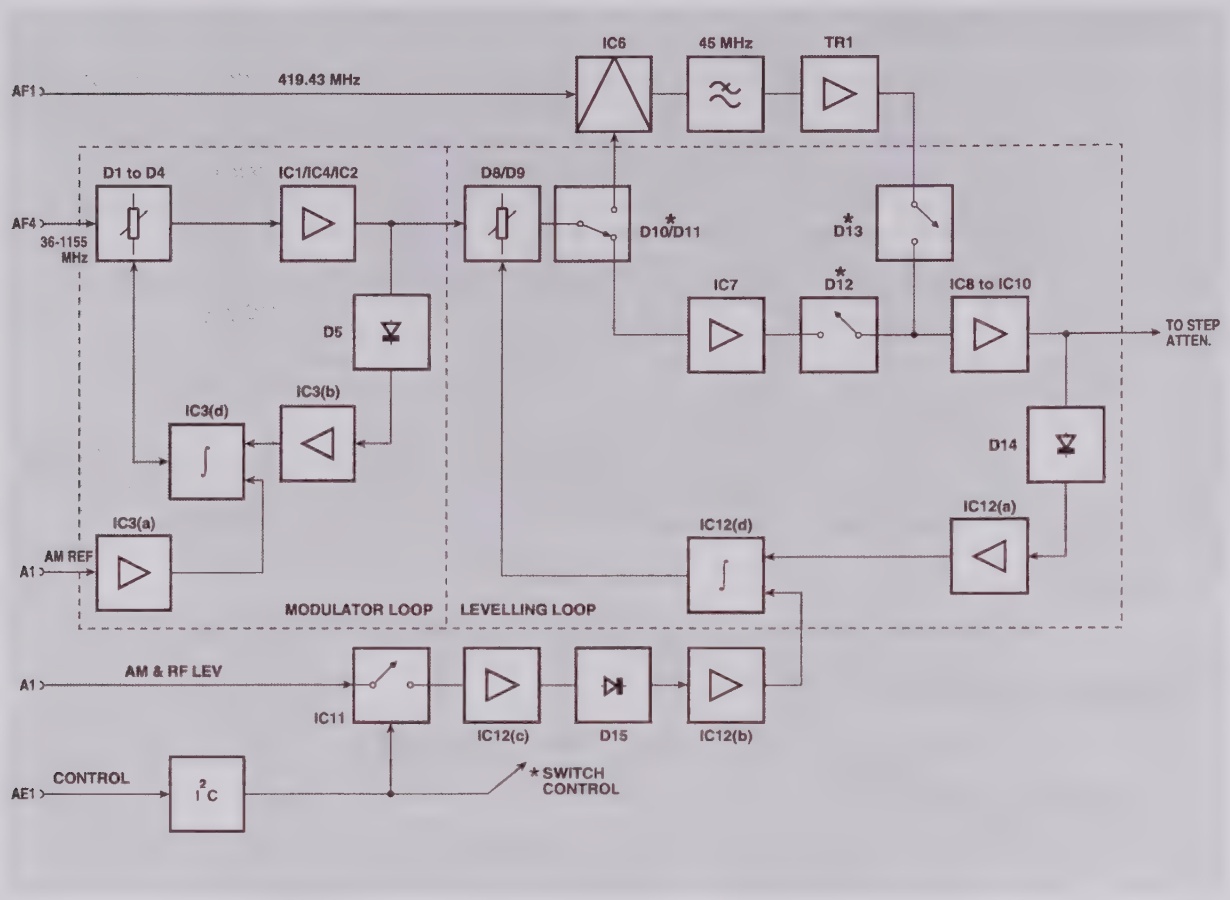

Fig. 1-17 AF5 board - block diagram

There are two control loops, one to apply amplitude modulation without introducing distortion, and the other to apply the required RF level to the output without stripping off the modulation component. Signal inputs for modulation and level setting both come from the A1 board.

I²C bus control

I²C bus expander IC14 decodes the signals from AE1, providing the control signals for the board. The following table shows these decodes and their associated functions, which are described as they become relevant in the following sections.

Function	IC14 P2	IC14 P1	IC14 P0	D10	D11	D12	D13
Select 36-1150 MHz	X	X	Low	OFF	ON	ON	OFF
Select 100 kHz-36 MHz	X	X	High	ON	OFF	OFF	ON
AF1 DOUBLER ON	X	Low	X	X	X	X	X
Output level fixed on	High	X	X	X	X	X	X

Amplitude modulation loop

R1 to R3 provide a 6 dB pad to reduce the RF input to the modulating diodes D1 to D4, thus restricting signal swings to the linear portion of the diode characteristics, and preventing the generation of CW harmonics.

The AM REF modulating signal from A1 is applied via IC3(a) and IC3(d) to the diodes D1 to D4 to vary their conductance and amplitude modulate the RF signal. D5 detects the RF envelope, and C9 provides filtering. IC3(b) with D6, matched with D5, provide temperature compensation for the detector diode. Integrator IC3(d) then sets the RF level so that the detected level is the same as that of the reference fromIC3(a). The effect of this feedback loop is to maintain the output from IC2 to 9 dBm and to minimize distortion which might otherwise be introduced by amplitude modulation.

The AM REF modulating signal normally includes a DC component of 1.678 V which serves to bias D1 to D4 in the centre of their attenuation characteristic. When RF levels between +7 dBm and +13 dBm are required on the TNC connector, the DC component is increased to 3.356 V which provides reduced attenuation and hence increased drive to achieve the required output. Note that AM modulation cannot be used at these higher RF output levels.

36 MHz to 1150 MHz signal path

D11 is On (forward-biased), D10 is Off, D12 is On, and D13 is Off, thus routeing the RF signal from IC2 through IC7, IC8 to IC10, the PCB pad and SMA connector to the signal generator's attenuator. Amplifiers IC7 and IC8 to IC10 provide the required drive to permit user selection of signal generator output of up to 13 dBm at the TNC connector.

100 kHz to 36 MHz signal path

D11 is Off, D10 is On, D12 is Off and D13 is On, thus routeing the RF signal from IC2 to the balanced mixer IC6, where it is mixed with the 419.43 MHz signal from AF1, amplified by TR1 and fed to IC8. The mixer produces the required frequency range because, for signal generator operation between 100 kHz and 36 MHz, the input signal from AF4 is in the range 420 MHz to 456 MHz.

Output levelling

The AM and RF LEV signal comprises an AM signal superimposed on a DC level equivalent to the RF level setting. The AM component is used to prevent the output levelling loop circuit from stripping off the AM modulation.

The RF level component is applied via switch IC11, IC12(c) and IC12(b) to IC12(d) integrator non-inverting input. IC12(d) sets the attenuation introduced into the RF signal path by D8 and D9. D14/C48 detects the RF level from IC10 and the resulting signal is applied to the inverting input of IC12(d) after buffering by IC12(a). The loop reaches a steady state when the RF output reaches the level demanded by the RF level setting.

Within this circuit, control is exercised in 0.1 dB steps, through a 10 dB range. The step attenuator subsequently applies 10 dBm attenuation steps to achieve the required output level. Note that for non-AM operation, the action of the amplitude modulation loop extends the available RF output level by 10 dB.

At low modulation frequencies the AM component of the signal detected by D14/C48 would tend to strip the amplitude modulation from the modulated signal, but the AM component of the AM AND RF LEV signal is applied (via IC11, IC12(c) and IC12(b)) to the non-inverting input of IC12(d), thus nulling the effect of the detected AM component.

Reference predistortion

The circuits IC12(c), D15/C54/R56/R58 and IC12(b) minimise the effects of any distortion introduced to the RF modulation envelope. These effects can be caused by:-

- Change in the characteristics of the detector circuit D14/C48/R51 at low modulation frequencies. This is minimised by the adjustment of R58.
- Change in the characteristics of D14 with temperature. This is minimized by the use of forward-biased D15 which is matched with D14.

Reverse power protection

Though reverse RF power connected into the circuits is handled by the main attenuators on the AA1 board, D17 to D19 provide protection for the AF5 board circuits for the few milliseconds before the AA1 board attenuators switch in.

Monochrome monitor

Circuit diagram: Fig. 7-166

Introduction

The circuitry shown on the circuit diagram, together with a CRT, forms an integral monochrome monitor of high resolution. This is a bought-in unit, designed for use in a variety of environments, enabling certain components to be omitted when not required. Components that are not fitted in this particular application are mentioned, where applicable, in the following text.

There are three inputs to the unit from the A5 board:-

- A horizontal synchronizing signal HSYNC on PL2-3.
- A video signal on PL2-5.
- A vertical synchronizing signal VSYNC on PL2-7.

The INTENSITY control on the front panel is wired to PL3 pins 1 to 3. Internal preset controls are accessible through holes in the unit case after removal of the test set cover.

Horizontal deflection circuits

IC2 is an ASIC that generates the horizontal time base waveform in accordance with the HSYNC input and the settings on the PHASE and H HOLD controls. In this application, PL2-3 is wired directly to the junction of R60 and R62, so the HSYNC signal is fed to IC2 pins 8 and 9. None of the components marked HSYNC PROCESSOR are fitted, i.e. Q1, Q11, Q2, etc., except R11 in the video input circuit. Note also that IC2 pin 10 output is not used, R59 and C27 being omitted.

Q3 is the horizontal driver, its gate being connected to the output of IC2 on pin 2 which is a drive pulse. The CRT deflection coil circuit is connected to SCAN pins 1 and 2 in the drain circuit of Q3. From the same point, there is also a drive to transformer T1 in the EHT generation circuit. Components not fitted in this area are R34, R35, L2 and C26.

Vertical deflection circuits

IC1 is an ASIC that generates the vertical timebase waveform in accordance with the VSYNC input on pin 8 and the settings on the various vertical controls. Its output on pin 4 is routed to and from the vertical deflection coils via scan pins 3 and 4 and to the V SHIFT preset control. The ASIC includes a flyback generator circuit that generates a flyback blanking pulse on pin 3 which is fed to the video circuits. This pulse is generated regardless of whether or not there is a sync input.

Video circuits

The video input signal on PL2-5 is developed across R11 and the INTENSITY control which is wired in parallel with it to PL3-1 to PL3-3. It is then fed to Q7, the first stage in the video pre-amplifier. Q9, Q10 and associated components provide DC clamping of the pre-amplifier output. Q4 and Q5 form the output stage of the video amplifier whose output is fed to the cathode circuit of the CRT. Flyback blanking is provided by the blanking signal from IC1 and Q6.

CRT supply protection

All CRT supplies are protected by an integral flash protector on the valve base, and for each supply/signal line by a flash-blow series resistor.

Power supply unit

Circuit diagrams: Fig. 7-167 to 7-170

Introduction

The PSU is enclosed within a metal box at the rear of the test set. Mounted in the side of the box are the AC input connector and fuses, DC input connector and AC ON/DC ON power switch. The PSU provides all the supplies necessary for operating the test set. It contains two main boards, AC-DC converter board and DC-DC converter board, and there are two satellite boards, control 1 and control 2, which are mounted on the DC-DC converter board.

Input to the unit is one of the following:-

- DC supply between 11 V and 32 V at 225 W maximum.
- AC supply between 88 V and 132 V AC at frequency between 45 Hz and 440 Hz at 260 W maximum (110 V nominal).
- AC supply between 188 V and 265 V AC at frequency between 45 Hz and 440 Hz at 260 W maximum (240 V nominal).

The PSU is also supplied with a 125 kHz reference signal from A6 (via AR2), for the switched mode supplies.

AC-DC converter board (sheet 1)

AC supply operation

The mains supply is connected via SW1 in the AC ON position to a filter circuit. After filtering, the mains is applied via thermistors TH1 and TH2 to bridge rectifier D1. TH1 and TH2 protect the diodes in D1 should large transients be introduced on the mains input.

Voltage selector SW2, when in the 110 V position, selects a voltage doubler arrangement where the voltage derived from D1 is the sum of the charges on CE1 and CE2.

D1 output is a nominal 400 V DC and is used to produce a stabilized 21 V DC supply generated by a switched mode stabilization circuit centred on current mode controller IC1. IC1 produces a square wave on its output pin 6, synchronized to the 125 kHz reference on pin 4, and used to switch TR1 and TR2 on and off. The pulse width determines the current in transformer T1 and hence its output voltage. Voltage feedback is provided by optical diode IC2 from T1 output circuit to the voltage feedback pin 2 of IC1. There is also a current feedback connected to IC1 current sense input pin 3 via D4.

At switch on, IC1 requires approximately 0.5 mA to start, drawn through resistors R3/R4/R5 and voltage limited by DZ1. Inrush current is prevented by the two thermistors on the input side of D1. Once started, with TR1 and TR2 being switched by its output, IC1 requires approximately 30 mA to run, provided by series stabilizer circuit TR13/DZ3.

At the start of each cycle, C9 is charged to approximately half of D1 output via R3 and R4. At switch on when IC1 output switches on TR2, C9 discharges through D3 and a transformer coil. The pulse produced causes TR1 to switch on through another coil and R15, and also causes C9 to recharge through D2, ready for the next cycle.

The output winding of T1 is connected to a full-wave rectifier circuit. Changes in output voltage, referenced by zener DZ7 and associated components, provide the drive for optical diode IC2. This provides voltage feedback for the current mode controller IC1, as described previously. R147 provides a bleed to ensure that under no-load conditions IC1 does not stop operating.

DC supply operation

The 11 V to 32 V DC supply is connected via the CON2 plug and the supply circuit initiated via pins 1 and 2 of SW1. C62, C63, C12 L14, L12 and CE31 provides filtering of the DC supply.

TR8 provides a constant current source for the operation of changeover relay RL1. On switch on, there is a delay while CE24 charges through TR5. Once TR8 starts to conduct, its current is limited by TR5 and zener diode D25. Note that D7 is not fitted and is replaced with a wire link.

Thermal fuse F4 provides over-current protection. Diode D9 provides protection against the inadvertent connection of the DC supply in the wrong polarity.

DC-DC converter board (sheets 2 to 4)

Sheet 2 power generation circuits divide into a top section and a bottom section. The top section is controlled by a current mode controller IC3 (sheet 3) which switches TR14 and TR15 providing the drive to transformer T3/T4. The bottom section is controlled by another current mode controller IC7 which switches TR25 and TR27 providing the drive to transformer T6/T7. The principle of operation of these two switched mode stabilized circuits is similar to that described for the AC to DC converter board, so a detailed description is not given here.

Each of the current mode controllers (marked Converter 1 and Converter 2 on sheet 3) is fed with a 125 kHz synchronizing signal derived via transformer T8. Also shown on sheet 3 are the controller end voltage and current feedback processing circuits for IC3 and IC7, the input to these being derived from bridge circuits and transformer windings shown on sheet 2.

There are three series stabilizer circuits shown on sheet 4, two based on discrete components and the other on an IC regulator. These connect into the output circuits as shown in the top section of sheet 2, and provide stabilization of the –5 V 2 A, +12 V 2 A and 32 V 150 mA supplies.

Chapter 2
MAINTENANCE

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Board variants

Some variants of the original 2965 boards have been introduced during development, as shown in the following table.

Note **To simplify the descriptions in this chapter, only the basic board types (e.g. A1, A2, AA1) are referred to unless the variant has a particular significance in context.**

Table 2-1 2965 Series boards and variants

Board	Variant	Comments
A1	A1/2	
A2	A2/2	
A3		
A4		2966A only
A5		
A6	A6/2	
A7		
A8		2966A only
AA1	AA1/1	
AB2		
AB3		2966A only
AE1		
AE2		
AE3		
AE4	AE4/2	
AE5		
AE6	AE6/2	
AE7		
AE8		
AF1		
AF2		There are two distinct versions, early and late
AF3		
AF4		
AF5		
AR1	AR/2	
AR2		

Board and unit access

For the location of boards, refer to Fig. 2-1 (2965) on page 2-5 or Fig. 2-2 (2965A, 2966A) on page 2-6, and Fig. 2-3 on page 2-7.

Removal of covers

There are two covers (not shown): top and lower. Each is secured with eight countersunk self-tapping screws, four at the front and four at the rear. When refitting, ensure that the holes in the top cover for the loudspeaker are aligned correctly (at the rear), and that the ventilation holes in the lower cover are at the front.

A7 board

Disconnect two pipes, one at the top of the AB2 board under the A7, the other at PLD on the A7. Disconnect PLA, PLB and PLE. Remove the three securing screws. Note that the board plugs into the keyboard, so to remove it, carefully ease it towards the rear of the test set. Lift the board carefully and then disconnect the lead to PLC on the underside of the board. When refitting the board, be careful to align the A7 and keyboard connectors when plugging in the board.

A1, A2, A3 and A5 boards (2965, 2965A)
A1, A2, A3, A4, A5 and A8 boards (2966A)

These boards are mounted on a hinged assembly as indicated in Fig. 2-1 (2965) or Fig. 2-2 (2965A, 2966A). To gain access to the boards, undo the two securing screws located either side of the attenuator unit and carefully lift the hinged assembly. Note that before the unit can be raised fully, PLN on the A5 board and two connectors to A3 must be disconnected. Individual boards can be taken out by removing the appropriate securing screws and spacers and disconnecting the associated connectors.

A6 board (2965)
A6/2 board (2965A, 2966A)

This board is mounted on the frame below the hinged assembly, as indicated in Fig. 2-1 (2965) or Fig. 2-2 (2965A, 2966A). To remove it, simply unscrew the nine mounting screws and disconnect all connectors.

AR1 and AR2 boards

These boards are frame mounted towards the rear of the test set, behind the hinged assembly, AR2 at the top and AR1 at the side. AR2 has five securing screws and AR1 four.

AE and AF boards

These boards are situated in the RF tray, which is mounted on the underside of the test set and has an upper and lower compartment. The AE boards are located inside the lower compartment and are easily accessed by removing the cover from the lower compartment. To gain access to the AF boards, the RF tray must be dismounted so as to access the upper compartment. To dismount the RF tray, disconnect the two pipes indicated in Fig. 2-3 and remove the four mounting screws. The RF tray can then be moved away from the test set frame sufficiently to be able to remove the cover on the upper compartment to reveal the AF boards.

AA1 switch unit

To remove this unit, first disconnect the four pipe connectors at the top, then the single pipe connector at the bottom. The rubber grommet securing the RF N-type connector and the nut securing the RF TNC connector must now be removed. Disconnect the multi-way connector to the A7 board. After removing the frame mounting screws at the side, the unit can then be removed by withdrawing it towards the rear.

AB2 power meter

This unit is situated below the A7 board but is accessed from the underside of the test set. Before turning the test set over, disconnect the pipe connector from the top of the unit. Turn the test set over and dismount the RF tray, as described above. The RF tray can then be swung aside to allow access to the AB2 mounting screws; undo the two screws at the bottom to remove the module, and then undo the seven screws at the side to remove the lid.

AB3 board

This board is situated below the A7 board but is accessed from the underside of the test set. Turn the test set over and dismount the RF tray, as described above. The RF tray can then be moved aside to allow access to the AB3 board.

Front panel

Firstly, remove the A7 board, as described previously. The front panel is secured at the top of its mounting frame by three countersunk screws, one in the middle and each of the others just inboard of an outer screw hole for the top cover. It is secured at the bottom of the frame by four countersunk screws roughly situated below the VOLUME, SQUELCH, INTENSITY and SCOPE POSITION controls. Before it can be removed, the rubber grommet securing the RF N-type connector and the nut securing the RF TNC connector must be removed. The front panel will then pull away from the test set. The wires to the back of the EXT MOD INPUT and AF INPUT connectors must then be unsoldered and two plugs disconnected before the unit can be removed.

CRT unit

The CRT unit has to be withdrawn from the front, so the first thing to do is remove the front panel as described above. Then remove the four securing screws at the top. The unit can then be withdrawn after disconnecting one in-line connector.

Power supply unit

To remove this unit, it is necessary to disconnect the rear panel. This process includes removing the four rear feet , hinging up the hinged assembly and breaking all plug connections to the rear panel. There are eight securing screws to be removed, four at each side. The rear panel and power supply unit, together with the AR1 and AR2 boards, can then be removed as one assembly and then dis-assembled, as required.

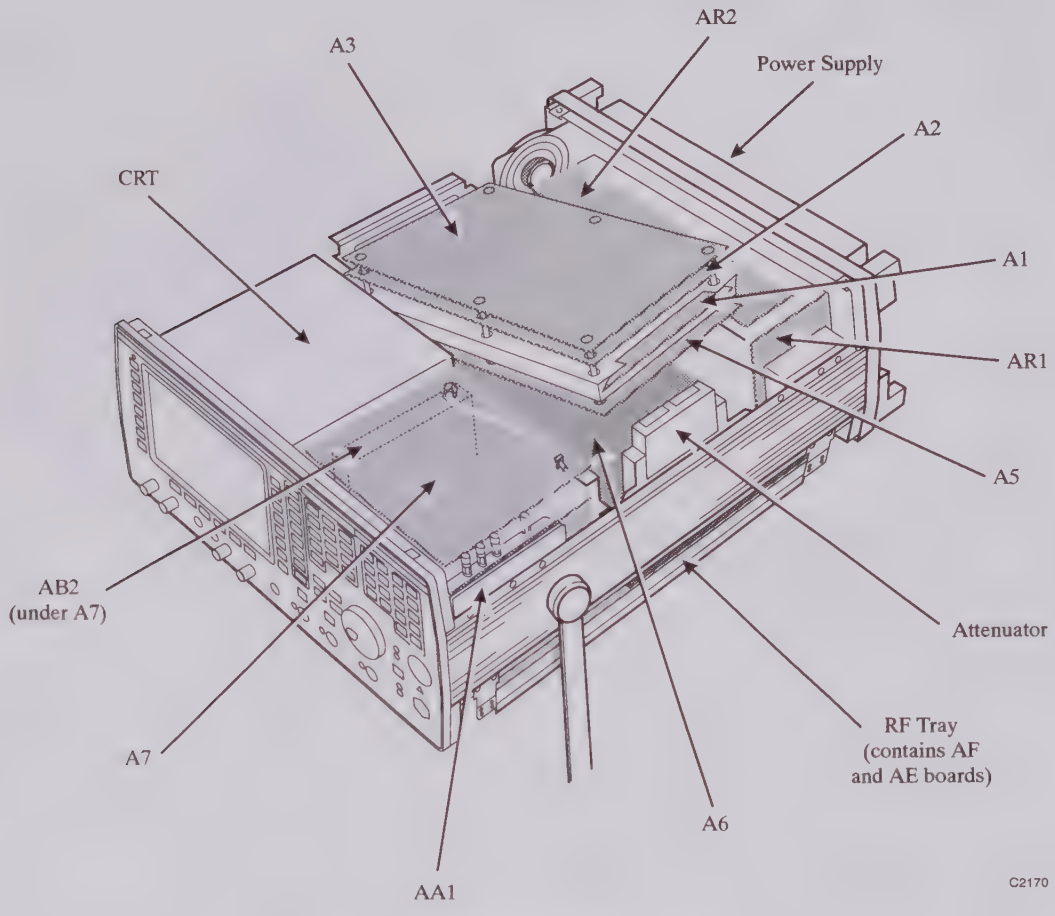

Fig. 2-1 Board and unit layout - 2965

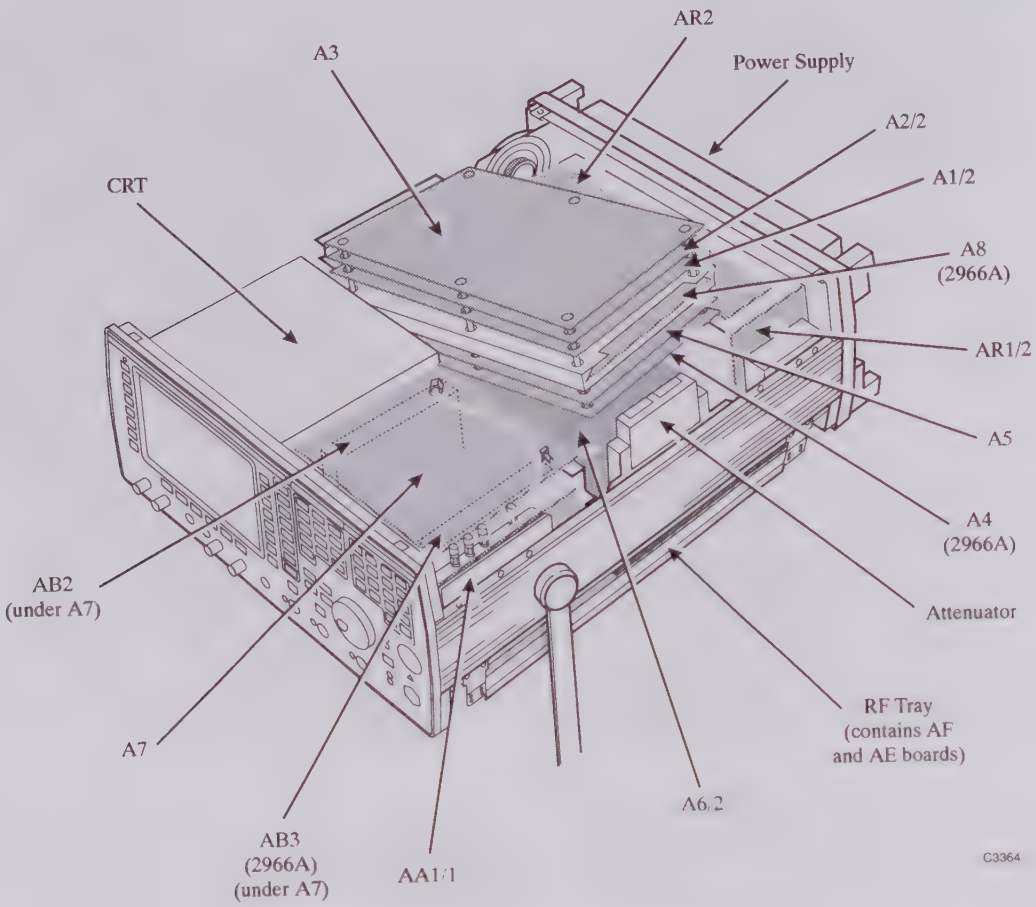

Fig. 2-2 Board and unit layout - 2965A, 2966A

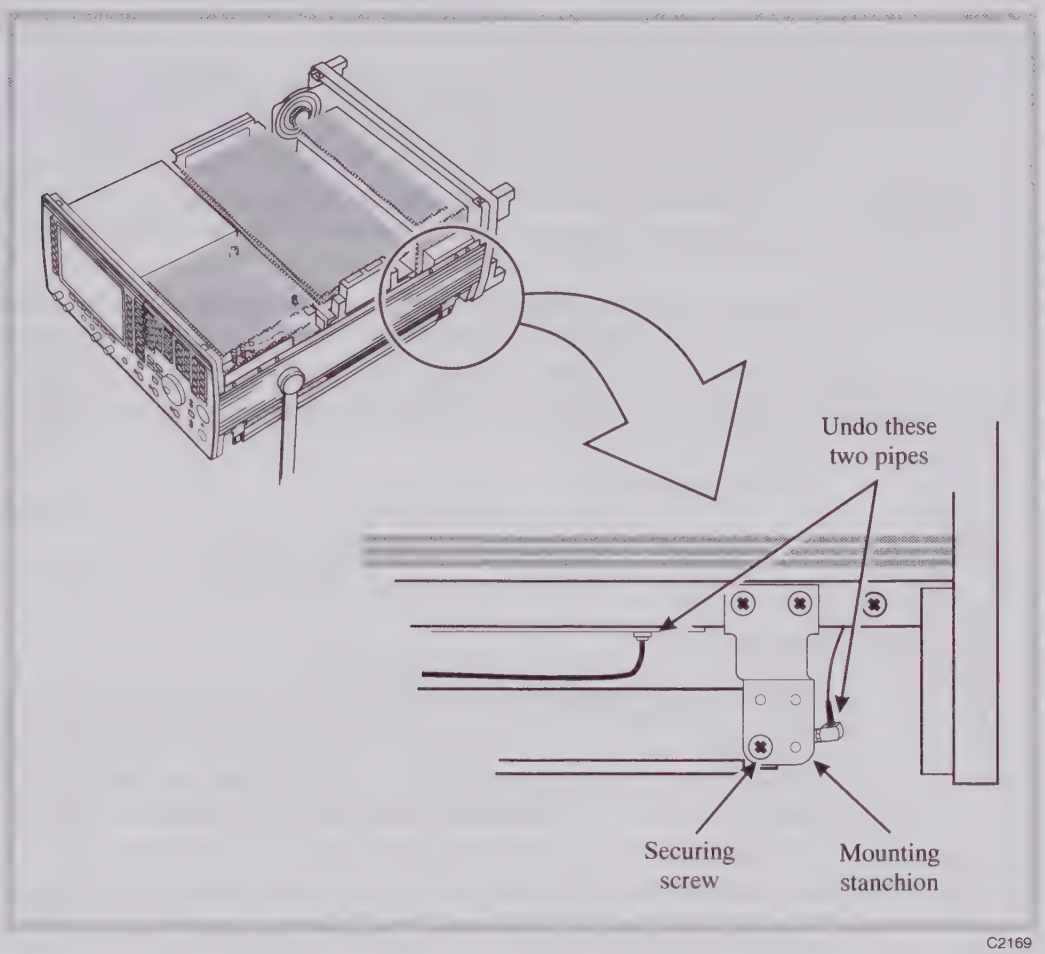

Fig. 2-3 RF tray removal

Service policy

For the majority of 2965 Series boards, support to component level and a board exchange service are provided. For lists of replaceable parts, refer to Chapter 6.

The following modules are not currently fully supported to component level, but can be exchanged as complete units:-

Unit	Part number
Attenuator SA	44429/072
Attenuator SG	44429/073
AA1/1 switch unit	44829/848 (early version) 44830/040 (current version)
AB1 power sensor	44991/024
Monochrome monitor	44991/051
Power supply unit	44991/052
Keyboard	46662/446

Note, however, that full component parts lists are provided in Chapter 6 for the AA1/1 switch unit, monochrome monitor and power supply unit. Major components can be supplied for these units for users wishing to carry out their own repairs.

Routine safety testing and inspection

In the United Kingdom, the 'Electricity at Work Regulations' (1989) section 4(2) places a requirement on the users of equipment to maintain it in a safe condition. The explanatory notes call for regular inspections and tests together with a need to keep records.

The following electrical tests and inspection information is provided for guidance purposes and involves the use of voltages and currents that can cause injury. It is important that these tests are only performed by competent personnel.

Prior to carrying out any inspection and tests, the test set must be disconnected from the mains supply and all external signal connections removed. All tests should include the test set's own supply lead, all covers must be fitted and the supply switch must be in the ON position.

The recommended inspection and tests fall into three categories and should be carried out in the following sequence:-

1. Visual inspection
2. Earth bonding test
3. Insulation resistance test

1. Visual inspection

A visual inspection should be carried out on a periodic basis. This interval is dependant on the operating environment, maintenance and use, and should be assessed in accordance with guidelines issued by the Health and Safety Executive (HSE). As a guide, this test set when used indoors in a relatively clean environment would be classified as 'low risk' equipment and hence should be subject to safety inspections on an annual basis. If the use of the equipment is contrary to the conditions specified, you should review the safety re-test interval.

As a guide, the visual inspection should include the following, where appropriate:-

- The equipment has been installed in accordance with the instructions provided (e.g., ventilation is adequate, supply isolators are accessible, supply wiring is adequate and properly routed).
- The condition of the mains supply lead and supply connector(s).
- Mains supply switch isolates the test set from the supply.
- The correct rating and type of supply fuses.
- Security and condition of covers and handles.
- Supply indicator functions (if fitted).
- Presence and condition of all warning labels and markings and supplied safety information.
- Wiring in re-wireable plugs and appliance connectors.

If any defect is noticed, this should be rectified before proceeding with the following electrical tests.

2. Earth bonding tests

Earth bonding tests should be carried out using a 25A (12V maximum open circuit voltage) DC source. Tests should be limited to a maximum duration of 5 seconds and have a pass limit of 0.1 Ω after allowing for the resistance of the supply lead. Exceeding the test duration can cause damage to the equipment. The tests should be carried out between the supply earth and exposed case metalwork, no attempt should be made to perform the tests on functional earths (e.g. signal carrying connector shells or screen connections) as this will result in damage to the equipment.

3. Insulation tests

A 500 V DC test should be applied between the protective earth connection and combined live and neutral supply connections with the equipment supply switch in the 'on' position. It is advisable to make the live/neutral link on the appliance tester or its connector to avoid the possibility of returning the test set to the user with the live and neutral poles linked with an ad-hoc strap. The test voltage should be applied for 5 seconds before taking the measurement. Marconi Instruments products employ reinforced insulation in their construction and hence a minimum pass limit of 7 MΩ should be achieved during this test.

Where a DC power adapter is provided with the test set, the adapter must pass the 7 MΩ test limit.

We do not recommend dielectric flash testing during routine safety tests. Most portable appliance testers use AC for the dielectric strength test which can cause damage to the supply input filter capacitors.

4. Rectification

It is recommended that the results from the above tests are recorded and checked during each repeat test. Significant differences between the previous readings and measured values should be investigated.

If any failure is detected during the above visual inspection or tests, the test set should be disabled and the fault should be rectified by an experienced Service Engineer who is familiar with the hazards involved in carrying out such repairs.

Safety critical components should only be replaced with equivalent parts, using techniques and procedures recommended by Marconi Instruments Ltd.

The above information is provided for guidance only. Marconi Instruments products are designed and constructed in accordance with International Safety Standards such that in normal use they represent no hazard to the operator. Marconi Instruments Ltd reserve the right to amend the above information in the course of continuing its commitment to product safety.

Chapter 3
ADJUSTMENT AND CALIBRATION

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Introduction

Instrument software versions

The following procedures are based on test sets containing A6 software Version 5.4 or above.

Default start-up

To minimise the number of key presses that you will need to make to obtain the correct settings, each section assumes that the test set is being configured from the test set factory default power-on state. To ensure that this occurs, initially press the following keys:-

For SW Versions pre 7.1: [HELP SET-UP], *[SET-UP], [DEFAULT VALUES], [INIT DEFAULT],* [HELP SET-UP], *[RESET].*

For SW Version 7.1 onwards: [HELP SET-UP], *[SET-UP], [MISC CONFIG], [default values], [init default],* [HELP SET-UP], *[RESET].*

Each time the key sequence shown below is used, when called for in the following procedures, the test set will reset to a known power-on state.

[HELP SET-UP], *[RESET]*

Marconi Access

A number of software calibrations are contained under the MARCONI INSTRUMENTS ACCESS menu. This menu is obtained via the following hidden key sequence:-

Press [HELP SET-UP].

Press, in turn, the unlabelled soft keys on the left side of the screen as follows:-

4th from bottom, 3rd from bottom, 2nd from bottom, bottom, bottom, 2nd from bottom, 3rd from bottom, 4th from bottom.

At the end of the key presses, the *[Marconi Access]* soft key should be displayed on the left side of the display.

Adjustment sequence

To meet their high performance specifications, the 2965 Series test sets make use of a complex set of alignment procedures, many of which are interactive. If you are not fully familiar with the test set, it is recommended that you read the technical description (Chapter 1) to gain a basic understanding of the instrument and its internal operation prior to attempting any adjustments.

Some guidance is given in the text on the possible effects of an adjustment on other areas; however, the general rules given below should be followed.

General rules

Before attempting any of the adjustments, User calibration (see page 3-3) should be run, as this may be all that is necessary to resolve your calibration problems. User calibration should also be run after any in-depth calibrations/manual adjustments have been made.

If running User calibration does not resolve the problem, then the relevant Marconi Access software calibrations (see page 3-3) should be carried out, after which the test set should be RESET and User calibration re-run.

Once set in the factory, the hardware adjustments (potentiometers/trimmers) are not likely to require readjustment unless repairs are carried out on a given board or a board is replaced. After hardware adjustments, any relevant Marconi Access software calibrations should be carried out, and finally User calibration should be re-run.

User calibration

Power meter

(1) Press [HELP SET-UP], *[CAL]*.

(2) Press *[power meter]*, wait approximately 1 minute for the calibration to finish.

Multimeter

(1) Press [HELP SET-UP], *[CAL]*.

(2) Press *[m'meter cal]*, wait approximately 1 minute for the calibration to finish.

Spectrum analyzer

(1) Press [HELP SET-UP], *[CAL]*.

(2) Press *[specana levels]*, wait approximately 2 minutes for the calibration to finish.

Audio filters

(1) Press [HELP SET-UP], *[CAL]*.

(2) Press *[audio filters]*, wait approximately 2 minutes for the calibration to finish.

Digital signal generator (2965/65A Option 21 and 2966A only)

(1) Press [HELP SET-UP], *[CAL]*.

(2) Press *[digital sig gen]*, wait approximately 2 minutes for the calibration to finish.

Digital power (2965/65A Option 21 and 2966A only)

(1) Press [HELP SET-UP], *[CAL]*.

(2) Press *[digital power]*, wait approximately 1 minute for the calibration to finish.

Marconi Access software calibrations

Setting the test set 10 MHz frequency standard (AR1/2 board)

Note: The test set should have been ON for at least 30 minutes before making this adjustment.

(1) Set [Rx TEST], [RF SELECT] TNC output, [RF GEN], [FREQ] 1000 [MHz], [LEVEL] 0 [dBm]. Ensure that all modulation generators are OFF.

(2) **For SW Versions pre 7.1:** Press [HELP SET-UP], *[SET-UP]*, *[INPUT OUTPUT]*, *[BNC set-up]*, *[INT/EXT REF]* to select INT REFERENCE USED / REAR PANEL OUTPUT. For a 2966A test set, use *[FREQ STD]* to select 10 MHz OUTPUT.
For SW Version 7.1 onwards: Press [HELP SET-UP], *[SET-UP]*, *[MISC CONFIG]*, *[select int/ext]*, *[int/ext ref]* to select INT REFERENCE USED / REAR PANEL OUTPUT. For a 2966A test set, use *[freq std]* to select 10 MHz OUTPUT.

(3) Press [HELP SET-UP], *[return]*.

(4) Connect a frequency counter to the EXT REF BNC socket on the rear panel of the UUT. The counter should be locked to a frequency reference of 1 part in 10^9 or better.

(5) Press [HELP SET-UP], *[Marconi Access]*, *[PROD'N VALUES]*, *[Prod Values]*, *[AR1/2]* to highlight AR1/2 setup value : *xxx* (*xxx* is a number between 0 and 255 which represents the data sent to the AR1/2 board across the I^2C communication link).

(6) Use the VARIABLE rotary control to vary the data sent to the AR1/2 board so that the reading on the frequency counter is 10 MHz ±1 Hz.

(7) Connect the counter to the RF TNC output port on the front panel. Adjust the VARIABLE control for a reading of 1000 MHz ±30 Hz on the counter.

(8) Store the data by pressing the ENTER data key.

Press [HELP SET-UP], *[return]* to return to normal operation.

Ammeter calibration

From any screen except HELP AND SET-UP:-

(1) Press [AF TEST], *[MULTIMETER]*, *[DC AMPS]*.

(2) Apply an accurate 1 A DC to the test set ammeter.

(3) Note the reading on the test set. If this is not 1 A:-

(4) Press [HELP SET-UP], *[Marconi Access]*, *[cal values]*, *[multimeter]*, *[Curr Sense]*.

(5) Enter a new value (the default is 9800, increasing the number reduces the current reading); terminate entry using the ENTER data key. Return to the multimeter display and check the displayed current. Repeat the process until the ammeter reads 1 A.

(6) Press [HELP SET-UP], *[RESET]*.

Squelch offset gain figure (software)

(1) Press [HELP SET-UP], *[Marconi Access]*, *[PROD'N VALUES]*, *[Prod Values]*, *[Squelch Offset]* to enter the squelch offset gain figure. This should be set to the default value of 1000. Terminate entry using the ENTER data key. Press [HELP SET-UP] followed by *[return]* to get back to the normal display screen.

(2) Press [Tx TEST] and connect a voltmeter to TP15 on board A2.

(3) Set the SQUELCH control fully counter-clockwise and note the voltage. This voltage will be referred to as *ccw*.

(4) Set the SQUELCH control fully clockwise and note the voltage. This voltage will be referred to as *cw*.

(5) Calculate the new squelch offset (gain) value as follows:-

$$\text{New value} = 1000 \times \frac{(ccw - 0.34)}{(ccw - cw)}$$

(6) Round the result up or down to the nearest integer and enter the new value into the squelch offset (gain) as above.

(7) Press [HELP SET-UP] followed by *[return]* to get back to the TRANSMITTER TEST screen and check that TP15 on A2 board is at 0.34 V ±20 mV when the SQUELCH control is fully clockwise. If *not*, adjust the squelch (gain) figure slightly. Reducing the gain figure makes the voltage on TP15 more positive.

(8) Press [HELP SET-UP], *[RESET]*.

FFT DC marker suppression (software)

(1) Press [HELP SET-UP], *[RESET]*

(2) Press [HELP SET-UP], *[Marconi Access]*, *[cal values]*, *[scope & fft]*, *[cal config]*.

(3) Set *[AF FFT Offset]* and *[DM FFT Offset]* to OFF.

(4) Press *[return]*, *[CAL]* and wait approximately 1 minute for the message Scope and fft cal finished.

(5) Press *[store data]*, *[return]*.

(6) Verify that the text beneath the WARNINGS annotation is None; if not, repeat the calibration procedure.

(7) Press [HELP SET-UP], *[RESET]*.

Audio & demod calibration (software)

(1) Press [HELP SET-UP], *[RESET]*

(2) Press [HELP SET-UP], *[Marconi Access], [cal values], [audio & demod].*

(3) Press *[CAL].*

(4) Wait approximately 20 minutes for the message Audio cal finished.

(5) Press *[store data], [return].*

(6) Verify that the text beneath the WARNINGS annotation is None; if not, repeat the calibration procedure.

(7) Press [HELP SET-UP], *[RESET].*

Spectrum analyzer (AE6 board) crystal filters
(Manual software adjustment via spectrum analyzer diagnostics screen)

Description

The crystal filters in the test set receiver can be set up and adjusted using the spectrum analyzer diagnostics screen. This screen is accessed by entering the HELP AND SET-UP screen and pressing *[Marconi Access]* followed by *[PROD'N VALUES]* and *[Specana diag].* This brings up an expanded spectrum analyzer screen.

On this screen, the title bar is split into four sections, each of which contains the name and current value of one of the crystal filter parameters:-

Δ C.F.	Centre frequency adjustment.
STRAYS	Null strays adjustment.
BWIDTH	Bandwidth adjustment.
δ GAIN	Filter gain adjustment.

Each of these parameters can be adjusted up or down using increment/ decrement keys - see below. Each parameter has a range of 0 to 4095, and there is an associated soft key *[INC]*: that can be used to change the increment size in steps of 1, 10, 100, or 200.

Screen title	To adjust, use
Δ C.F.	INC ΔFREQ [⇧] and [⇩] hard keys.
STRAYS	*[NUL STRAYS]* soft keys.
BWIDTH	*[B/W]* soft keys.
δ GAIN	INC δ [⇧] and [⇩] hard keys.

Using the soft key *[change filter]*, you can cycle through the filters in the following sequence:-

default filter
300 Hz crystal filter
1 kHz crystal filter
3 kHz crystal filter
10 kHz crystal filter
30 kHz crystal filter
110 kHz ceramic filter
280 kHz ceramic filter
3 MHz ceramic filter

The ceramic or default filters cannot be adjusted. The default selection will give the default filter for the current span.

Notes on adjustments

(1) The centre frequency adjustment is effective normally for the 300 Hz, 1 kHz and 3 kHz filters, while the null strays adjustment is used to set the centre frequency of the 10 kHz and 30 kHz filters.

(2) Full dB/div and marker facilities are available to allow the accurate measurement of a 3 dB bandwidth.

(3) If an external signal generator is used to provide the input, the test set and the external signal generator must be locked to the same frequency standard to ensure, in particular, the correct setting of the centre frequency. This problem does not occur if the test set signal generator is used (remember to set up the required frequency, level, and mod OFF before entering the HELP AND SET-UP screens).

(4) The bandwidth adjustment is such that decreasing the value results in increasing bandwidth.

(5) When the 3 MHz filter is selected, the level displayed is 10 dB lower than the true level - bear this in mind if you are tuning the crystal filter gains to the same level as the 3 MHz filter.

(6) Running the crystal filter gain calibration after making these adjustments should set the gain properly without too much effect on the other parameters provided that the gain is set reasonably closely as part of these adjustments (displayed 3 MHz filter level plus 10 dB).

(7) Note that the input switch configuration cannot be changed on this screen, so you should ensure that it is set as required before entering the HELP AND SET-UP screens.

(8) When exiting the spectrum analyzer diagnostics screen, always use the *[return]* key, not the [HELP SET-UP] key.

Adjustment of crystal filters

(1) Press [RF SELECT] to set the TNC RF socket to 1-port duplex, then press [RF GEN], [LEVEL], –24 [dBm], [Tx], [FREQ] 150 [MHz]. Select *[Rx mod OFF]*.

(2) Using a short cable, connect the N-type socket to the TNC RF socket.

(3) Press [HELP SET-UP], *[Marconi Access]*, *[PROD'N VALUES]*, *[Specana diag]*. Select a span of 500Hz/div, a REF LEVEL of –20 dBm, press *[dB per div]* for a PER DIV of 1 dB.

(4) Press the *[change filter]* soft key until the 110 kHz filter is selected. Measure the level of the signal on the screen and if necessary return to duplex mode (use the [DUPLEX TEST] key, *not* the *[return]* soft key). Readjust the signal generator level to centre the displayed level 4 dB down from the top of the screen (on middle graticule line). Return to the spectrum analyzer diagnostic screen.

(5) **300 Hz filter adjustment:-**

Press the *[change filter]* soft key until the 300 Hz filter is selected. Select *[markers ON]*, *[move M1]*. Using the VARIABLE rotary control, move the marker to the left side of the screen. Select *[move M2]* and move M2 until ΔM at the top of the screen indicates 300Hz. Press *[lock M1←→M2]* and then move the locked markers until they are centred about the middle of the screen (M2 indicates 150.000150MHz).

(a) Use the δ keys (near VARIABLE rotary control) to set the signal level to the centre graticule line (–4 dB).

(b) Use the ΔFREQ keys to tune the signal until it is centred in the middle of the screen.

(c) Use the *[B/W]* soft keys to position M1 and M2 on, or as close as possible to, the horizontal graticule line 3 dB down from the centre line.

(d) Repeat adjustments (a) to (c) until all three are correct.

(6) **1 kHz filter adjustment:-**

Press *[change filter]* until the 1 kHz filter is selected. Press the *[unlock M1←→M2]* soft key. Move M2 until ΔM at the top of the screen indicates 1kHz. Press *[lock M1←→M2]* and then move the locked markers until they are centred about the middle of the screen (M2 indicates 150.000500 MHz).

Repeat adjustments (a) to (d) as for the 300 Hz filter.

(7) **3 kHz filter adjustment:-**

Press *[change filter]* until the 3 kHz filter is selected.

Press the *[unlock M1←→M2]* soft key. Move M2 until ΔM at the top of the screen indicates 3 kHz. Press *[lock M1←→M2]* and then move the locked markers until they are centred about the middle of the screen (M2 indicates 150.001500MHz).

Repeat adjustments (a) to (d) as for the 300 Hz filter. Some adjustment of null strays in addition to the ΔFREQ adjustment may be needed in step (b).

(8) **10 kHz filter adjustment:-**

Press *[change filter]* until the 10 kHz filter is selected. Select a span of 2kHz/div.

Press *[unlock M1←→M2]* and move M2 until ΔM at the top of the screen indicates 10kHz. Press *[lock M1←→M2]* and then move the locked markers until they are centred about the middle of the screen (M2 indicates 150.005000MHz).

Repeat adjustments (a) to (d) as for the 300 Hz filter. Use the *[NUL STRAYS]* soft keys instead of ΔFREQ in step (b).

(9) **30 kHz filter adjustment:-**

Press *[change filter]* until the 30 kHz filter is selected.

Select a span of 5kHz/div.

Press *[unlock M1←→M2]* and move M2 until ΔM at the top of the screen reads 30kHz. Press *[lock M1←→M2]* and then move the locked markers until they are centred about the middle of the screen (M2 indicates 150.015000MHz).

Repeat adjustments (a) to (d) as for the 300 Hz filter. Use the *[NUL STRAYS]* soft keys instead of ΔFREQ in step (b).

(10) Press *[change filter]* until the default filter is selected, then press *[return]*, *[return]*, *[cal values]*, *[spec ana]*, *[store data]*.

(11) Press [HELP SET-UP], *[RESET]*.

Spectrum analyzer automatic calibration

(1) Press [HELP SET-UP], *[Marconi Access]*, *[cal values]*, *[spec ana]*, *[CAL]*. Wait 5 minutes for the message Rx system cal finished.

(2) Press *[store data]*, *[return]*. Verify that the text beneath the WARNINGS annotation is None; if not, repeat the calibration procedure.

(3) Press [HELP SET-UP], *[RESET]*.

Signal generator

Signal generator FM & RF level calibration

(1) Turn the SQUELCH control on the front panel to minimum.

(2) Press [HELP SET-UP], *[RESET]*.

(3) Press [HELP SET-UP], *[Marconi Access]*, *[cal values]*, *[signal gen]*, *[cal config]*. At the bottom of the CAL VALUES : SIG GEN CONFIG screen, for signal generator calibration, there should be a message: Prediction factor = 38. If this value is not 38, press *[TOGGLE VAR]* and use the VARIABLE rotary control to set it to 38.

(4) Press *[return]* and *[CAL]*. Wait approximately 25 minutes for the signal generator calibration to finish.

(5) Press *[store data]*, *[return]*. Verify that the text beneath the WARNINGS annotation is None; if not, repeat the calibration procedure.

(6) Press [HELP SET-UP], *[RESET]*.

Signal generator AM/PM calibration.

(1) Press [HELP SET-UP], *[Marconi Access]*, *[cal values]*, *[audio gen]*, *[CAL]*. Wait 1 minute for the message A1 cal finished.

(2) Press *[store data]*, *[return]*. Verify that the text beneath the WARNINGS annotation is None; if not, repeat the calibration procedure.

(3) Press [HELP SET-UP], *[RESET]*

(4) Connect the TNC RF socket of the test set to a modulation meter (e.g. MI 2305). Set the modulation meter to monitor AM. If an MI 2305 is being used, set it to AM, noise average, filter 300 Hz-3.4 kHz, CAL.

(5) Set [Rx TEST], [RF SELECT] TNC output, [RF GEN], [LEVEL] 0 [dBm], [FREQ] 101 [MHz], [MOD GEN], [LEVEL] 60 [%], [FREQ] 1 [kHz].

(6) Press [HELP SET-UP], *[Marconi Access]*, *[cal values]*, *[audio gen]*, *[cal config]*, *[TOGGLE VAR]* to ON.

(7) Note the AM depth indicated on the modulation meter. Calculate the error from 60% and enter this error into the test set by rotating the VARIABLE control; the entered error will be displayed on the test set screen adjacent to the *[TOGGLE VAR]* soft key (e.g. if reading is 59.5%, rotate control until +0.500% is displayed).

(8) Press *[return]*, *[store data]*, [HELP SET-UP], *[RESET]*.

(9) Press [RECALL] 0 to check the measurement, and if necessary readjust.

(10) Press [HELP SET-UP], *[RESET]*

External modulator calibration

(1) Press [HELP SET-UP], *[Marconi Access]*, *[cal values]*, *[extern mod]*, *[CAL]*. Wait for the message External mod cal finished.

(2) Press *[store data]*, *[return]*. Verify that the text beneath the WARNINGS annotation is None; if not, repeat the calibration procedure.

(3) Press [HELP SET-UP], *[RESET]*.

Scope and FFT calibration

(1) Press [HELP SET-UP], *[Marconi Access]*, *[cal values]*, *[scope & fft]*, *[CAL]*. Wait for the message Scope and fft cal finished.

(2) Press *[store data]*, *[return]*. Verify that the text beneath the WARNINGS annotation is None; if not, repeat the calibration procedure.

(3) Press [HELP SET-UP], *[RESET]*.

AF scope calibration (manual insertion of data)

(1) The AF scope corrections are inserted manually using the PROD'N CAL : AUDIO MEASUREMENTS diagnostics screen. To enter this screen, press [HELP SET-UP], *[Marconi Access], [PROD'N VALUES], [Audio meas].*

(2) Press *[scope]*, then press *[change var par]* until the message Scope ref DAC appears at the top right of the screen. There is a calibration value for each of the scope ranges. Connect an accurate audio signal to the AF INPUT and for each range in the table below set the audio source level to the appropriate peak-to-peak or RMS value.

(3) Use the VARIABLE rotary control to change the Scope ref DAC value until the display shows correctly with reference to the graticule lines (keeping trace centred with scope position control). Be careful not to alter any other parameter.

	Level	
Range/div	**Peak-to-peak**	**RMS**
20 V	80 V	28.28 V
10 V	40 V	14.14 V
5 V	20 V	7.07 V
2 V	16 V	5.656 V
1 V	8 V	2.828 V
500 mV	4 V	1.414 V
200 mV	1.6 V	0.566 V
100 mV	800 mV	282.8 mV
50 mV	400 mV	141.4 mV
20 mV	160 mV	56.56 mV
10 mV	80 mV	28.28 mV
5 mV	40 mV	14.14 mV
2 mV	16 mV	5.56 mV

Note: If no voltage source is available for the higher voltage ranges, set the Scope ref DAC values for these ranges to the value obtained for the highest measurable range.

When you have finished the calibration, store the values by selecting [HELP SET-UP], *[Marconi Access], [cal values], [scope & fft], [store data].* Then press [HELP SET-UP], [RESET].

AM & PM demodulator FFT calibration (manual insertion of data)

The following section gives the procedure for manually calibrating the demodulator FFT for AM and PM using the DEMOD DIAGNOSTICS screen. To summarise the adjustment procedure, it uses the test set signal generator to provide a signal with either AM or PM to the modulation meter side of the test set. This modulation level is monitored on the external modulation meter and a correction figure is adjusted until the demod FFT indicates the same reading as that shown on the external modulation meter.

Note **The calibration for the FM demod FFT is done automatically during the initial Scope & FFT calibration procedure described at the start of this section.**

(1) Press [RF SELECT] to set the TNC RF socket to 1-port duplex. Using a T-piece, connect the N-type socket to the TNC socket and also to an external modulation monitor (e.g. an MI 2305). Initially, set the external modulation meter to monitor AM.

(2) Press [HELP SET-UP], *[Marconi Access], [PROD'N VALUES], [Demod meas].*

(3) Press [RF GEN], [LEVEL] 0 [dBm], [Tx], [FREQ] 150 [MHz].

(4) Press *[mod ana]*, [MOD GEN] 1, [LEVEL] 18 [%]. Press *[▼ ref level ▲]* to set the modulation analyzer reference level to 20% at the top graticule. From the power-on default, the demod filter should be set to 0.3-3.4 kHz, Mod 1 should be switched ON at a frequency of 1 kHz, Mod 2 and Mod 3 should be OFF, and the mod analyzer span should be 1 kHz/div. Check that this is the case; if not, select the appropriate settings.

(5) A marker reading is displayed beneath the FFT graticule display. The FFT offset value for the selected demod type and FFT reference level is displayed on the right side of the title box. Adjust this value using the VARIABLE rotary control until the marker reading indicates the same modulation level as that shown on the external modulation meter.

(6) Press *[▼ ref level ▲]* to select the second AM FFT range shown in the table below (50%) and then press [MOD GEN], [LEVEL] 45 [%] to set the test set to provide 45% AM. Again use the VARIABLE rotary control to adjust the marker reading so that it indicates the same modulation level as that shown on the external modulation meter. Repeat for the remaining FFT AM range.

(7) Press [MOD GEN], [LEVEL] 1.8 [rad], and carry out the same procedure for the FFT PM ranges and levels shown in the table. Set the external modulation meter to monitor phase modulation for these adjustments.

AM		PM	
FFT Range	**Mod Level**	**FFT Range**	**Mod Level**
20%	18%	2	1.8 rad
50%	45%	5	4.4 rad
100%	90%	20	18 rad

(8) When you have finished the calibration, **store the values** by selecting [HELP SET-UP], *[Marconi Access], [cal values], [scope & fft], [store data].*

(9) Press [HELP SET-UP], *[RESET].*

Demod noise correction calibration

(1) Set [Rx TEST], [RF GEN], [FREQ] 150 [MHz]. [RF SELECT] N-type output, then set [LEVEL] –17 [dBm].

(2) Press [HELP SET-UP], *[CAL], [demod noise].*

(3) Wait for the message Calibrating Demod Noise DONE. Press *[return], [RESET].*

Digital systems calibration (2965/65A Option 21 and 2966A only)

Note **For test sets containing A6/2 software before version 7.06, the test set must be set to single-port duplex mode, with the N-type socket selected, before running the digital systems calibration. Failure to do so may result in invalid calibration data.**

(1) Press [HELP SET-UP], *[Marconi Access], [cal values], [dsc].*

(2) Press *[CAL].*

(3) Wait approximately 20 minutes for the message DSC cal finished.

(4) Press *[store data], [return].*

(5) Verify that the text beneath the WARNINGS annotation is None; if not, repeat the calibration procedure.

(6) Press [HELP SET-UP], *[RESET].*

Hardware adjustments

1.35 GHz & 69.3 MHz receiver filters (AE4 board C1-C4, C6, C7, C12, C13, C14)

Note

The 1.35 GHz filter is of a helical design and is optimised by adjusting the 4 tuning capacitors C1 to C4. Once set up in the factory, it is *highly unlikely* that it will ever require further adjustment.

(1) Press [HELP SET-UP], *[RESET]*. The test set should power up in DUPLEX TEST mode.

(2) Press [RF GEN], [LEVEL] –40 [dBm], select *[Rx mod OFF]*, then press [Tx], [FREQ] 150 [MHz], *[duplex test (Tx)]*, *[spec ana]*, *[▼ ref level ▲]* 20 [dBm], *[bar charts]*.

(3) Connect a spectrum analyzer (e.g. MI 2382/83) to the IF output socket on the test set rear panel. Set the spectrum analyzer to a reference frequency of 10.7 MHz, reference level –30 dBm and 50 kHz span/div.

(4) Set up the 1.35 GHz filter by adjusting the inner tuning cores of C1 to C4 for maximum level at 10.7 MHz on the external spectrum analyzer. If you find the tuning core runs out of range, loosen the tuning slug nut and move the outer shell up or down as appropriate.

(5) Set up the 69.3 MHz filter by adjusting C6, C7, C12, C13 and C14 for maximum level at 10.7 MHz on the external spectrum analyzer.

Receiver 80 MHz 2nd LO (AE5 board C51)

(1) Remove the connector from PLC pins 1 and 2 and reconnect in set up position across pins 2 and 3.

(2) Allow 5 minutes warm up and then adjust C51 for a frequency of 80 MHz ± 100 Hz on connector PLD pin 2.

(3) Reconnect the link across PLC pins 1 and 2. Then adjust C51 for a voltage between –2 V and –4V on IC 10 pin 6.

Demodulation IF gain (AE7 board R154)

(1) Unplug the connector attached to AE7 PLC.

(2) Using a signal generator, apply a signal of 10.7 MHz at –50 dBm to PLC.

(3) On the test set, select [Tx TEST] and toggle *[IF BW]* to select a filter bandwidth of 280 kHz.

(4) Connect a DVM set to measure volts DC to PLH pin 2.

(5) Adjust R154 for a DVM reading of 3.5 V ± 0.05 V.

(6) Remove the signal generator and DVM, then reconnect PLC.

104 MHz VCXO gain (AF1 board C4)

(1) Monitor TP7 using an external spectrum analyzer and zero loss probe. Tune the external spectrum analyzer to 104.8576 MHz. Adjust C4 for maximum signal level on TP 7. This should be greater than –5 dBm (typically +10 dBm).

(2) Connect a DVM to TP1 and check for a DC level within the range 3 V to 7 V. Adjust C4 slightly if the voltage is outside this range.

(3) Recheck the 104 MHz signal at TP7 and ensure that it is still greater than –5 dBm.

419 MHz BPF gain (AF1 board L18)

(1) Set [Rx TEST], [RF GEN], [FREQ] 30 [MHz] (this ensures that the 419 MHz circuit is switched on).

(2) Using an external spectrum analyzer and zero loss probe, monitor the 419.4304 MHz signal at the soldered link between AF1 and AF5 boards. Adjust L18 for maximum signal level. (0 dBm ± 3 dB).

SSB receiver AGC reference (AE7 board R139)

This adjustment only affects SSB operation. The procedure can only be carried out if the test set has the SSB (Option 9) fitted.

(1) Press [RF TEST], *[SSB]*. Check that the default settings are as shown below; if not, select them:-

Tx tune	ON
gen 1	ON
gen 2	OFF
AF1 FREQ	1 kHz
AF1 LEVEL	100.0 mV

(2) Connect a signal generator set to provide 100.000 MHz at +10 dBm to the test set RF input. After a short time, the test set should tune to the following:-

AUTOTUNE	100.000 MHz ±10 Hz
MOD FREQ	1 kHz
POWER LSB	10 mW

(3) Press *[spec ana]* and set *[▼ ref level ▲]* to +10 dBm (a signal should appear with a peak at approximately 10 dBm).

(4) Press *[sband ana]*, then select *[expand ON]*, *[markers ON]*, *[peak find]*. M1 should indicate –4 dB ±2 dB.

(5) Monitor PLF pin 2 with a DVM set to measure volts AC, and adjust R139 for a level of 2.5 V RMS ±3 mV.

Setting up the 1 mW (10 MHz, 0 dBm) power reference (A7 board, R126)

(1) Press [HELP SET-UP], *[Marconi Access]*, *[cal values]*, *[power meter]*.

(2) Press *[CAL DAC offset]* 0 to turn Range 0 OFF.
Press *[CAL DAC offset]* 1 to turn Range 1 OFF.
Press *[CAL DAC offset]* 2 to turn Range 2 OFF.
Press *[CAL DAC offset]* 3 to turn Range 3 OFF.

(3) Press *[CAL]* immediately followed by *[PAUSE CAL]* (soft key beneath *[CAL]*).

(4) Disconnect the SMA lead from the input to the power meter sensor (located at the cut-out in the top left corner of the A7 board).

(5) Connect a calibrated external power meter (e.g. MI 6960 + 6912 sensor) to the end of this lead and adjust R126 until the external power meter reads 0.0 dBm ±0.02 dB.

(6) Remove the external power meter, reconnect the SMA lead to the test set power sensor and press [HELP SET-UP], *[RESET]*.

Audio input compensation adjustment (no filters selected) (A3 board C7, C35)

(1) Using a BNC cable, connect the AF GEN OUTPUT socket to the AF INPUT socket on the test set front panel.

(2) Press [AF TEST], *[AF IN/OUT],* [AF GEN] 1, [FREQ] 1 [kHz], [LEVEL] 1 [V]. Ensure that gen 1 is turned ON and that gen 2 and gen 3 are turned OFF.

(3) Press *[low pass]* until NONE is displayed as the selected filter.

(4) Note the audio level displayed on the test set voltmeter.

(5) Press [FREQ] 20 [kHz] and adjust C7 so that the measured level for a 20 kHz input is the same as that for the 1 kHz input noted in step 4.

(6) Set [AF GEN], [LEVEL] 100 [mV], [FREQ] 1 [kHz].

(7) Note the audio level displayed on the test set voltmeter.

(8) Press [FREQ] 20 [kHz] and adjust C35 so that the measured level for a 20 kHz input is the same as that for the 1 kHz input noted in step 7.

External modulator input compensation adjustment (A3 board C17,C21)

(1) Connect the front panel AF INPUT socket to A3 PLE pin 5 using a ×1 scope probe. Connect the front panel AF GEN OUTPUT socket to the EXT MOD INPUT socket.

(2) From power on, configure the test set as follows: [AF GEN], [LEVEL] 1 [V], [FREQ] 1 [kHz], *[duplex test (Rx)], [mod 1 OFF], [mod X ON]. [mod 2]* and *[mod 3]* should already be OFF. Press *[display mod]* until MOD X is displayed. Set [MOD GEN], [DEVN] 10 [kHz] and toggle *[low pass]* filter until NONE is displayed. Finally press [DUPLEX TEST].

(3) Note the AF LEVEL reading on the display.

(4) Set [AF GEN], [FREQ] 20 [kHz] and adjust A3 C21 for the same reading as noted in the previous step.

The path incorporating C17 is not used, so this adjustment is not required.

CRT brightness adjustment

(1) Turn the front panel INTENSITY control to its minimum position.

(2) Adjust the CRT module Intensity control (see Fig 3-1) so that the raster is just visible (shield the display from any light sources during this procedure).

(3) Return the front panel INTENSITY control to an acceptable level.

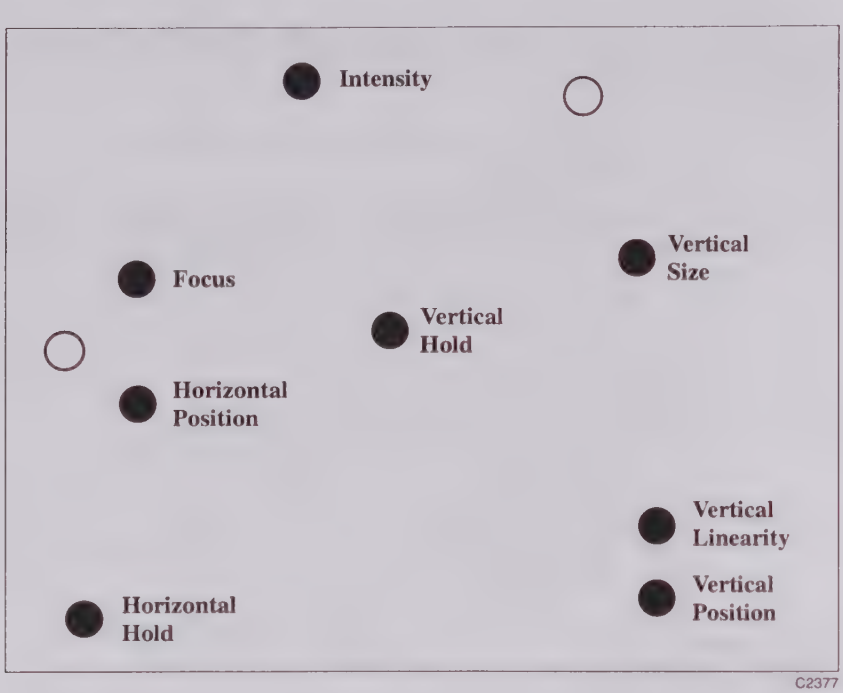

Fig. 3-1 CRT module adjustment locations

Setting the test set 10 MHz frequency standard (AR1 board R4)

Note: The test set should have been ON for at least 30 minutes before making this adjustment.

(1) Press [Tx TEST], [RF SELECT] TNC input, [Tx], [FREQ] 1000 [MHz].

(2) **For SW Versions pre 7.1:** Press [HELP SET-UP], *[SET-UP], [TEST OPTIONS], [misc].* **For SW Version 7.1 onwards:** Press [HELP SET-UP], *[SET-UP], [TEST OPTIONS], [Tx meas options].*

(3) Toggle *[res'n & rate]* to select a Tx counter resolution of 1 Hz. Then press *[return]* to get back to Tx TEST.

(4) Connect a signal generator (e.g. MI 2040) set to provide 1000 MHz at 0 dBm to the TNC RF input of the test set. The signal generator should be locked to an external reference of 1 part in 10^9 or better.

(5) Adjust R4 on AR1 board until the frequency offset displayed on the test set indicates ±10 Hz or less.

Spectrum analyzer adjustment (AE6 board only) (R157, R140 and R141)

(1) Set the test set as follows:- [Tx TEST], [RF SELECT] TNC input. Press *[IF BW]* until the 3 MHz IF filter is selected, press *[power BW]* to select IN BAND, [Tx], [FREQ] 101 [MHz], *[spec ana], [▼ ref level ▲]* 0 dBm (using the soft keys beneath the screen), *[bar charts].*

(2) Connect a signal generator set to provide –20 dBm at 101 MHz to the TNC RF input socket of the test set.

(3) Using a zero loss probe and external spectrum analyzer, measure the power level entering the log amp on R65 on AE6 board at 10.7 MHz. Adjust R157 until the level displayed on the external analyzer indicates –17 dBm.

(4) Refit the RF lid to the receiver tray.

(5) Set the test set IF filter bandwidth to 110 kHz.

(6) Set the signal generator level to –10 dBm. Adjust R140 for –10 dBm ±0.5 dB on the test set display (the power is displayed on the top line of the display).

(7) Set the signal generator level to –50 dBm. Note the reading on the test set display. If this is not –50 dBm ±0.5 dB, adjust R141 for twice the noted error. For example, if the reading is –51 dBm, adjust R141 for a reading of –52 dBm; this ensures that R141 is adjusted in the correct direction.

(8) Repeat the adjustment of R140 and R141 (steps (6) and (7)) until both are within 0.5 dB of their respective levels (–10 dBm & –50 dBm).

(9) Changing the signal generator level in 10 dB steps, check the linearity of the log amp between –50 dBm and –10 dBm. Each 10 dB step should be within ±1.5 dB. If necessary, readjust R140 & R141.

(10) Press [HELP SET-UP], *[Marconi Access], [cal values], [spec ana], [default data], [store data],* [HELP SET-UP], *[RESET].*

(11) Press [HELP SET-UP], *[Marconi Access], [cal values], [spec ana], [cal config].*

(12) On the CAL VALUES : SPEC ANA CONFIG screen, switch all cals OFF except the *[INPUT FILTER]* cal; this should be set to ON.

(13) Press *[return], [CAL].*

(14) Wait approximately 1 minute for the Rx system cal to finish.

(15) Press *[store data], [return].*

(16) Verify that the text beneath the WARNINGS annotation is None; if not, repeat the calibration procedure.

(17) Press [HELP SET-UP], *[RESET].*

(18) Set the following on the test set; [Tx TEST], [RF SELECT] TNC input, [Tx], [FREQ] 101 [MHz], *[spec ana], [▾ ref level ▴]* +10 dBm, *[bar charts], [IF BW]* to select 3 MHz, *[power BW]* to select IN BAND.

(19) Set the external signal generator to 101 MHz, 0 dBm. To ensure that the level supplied to the test set is as close to 0 dBm as possible, disconnect the lead from the test set TNC RF socket and temporarily connect it to a power meter (e.g. MI 6960/ 6912) and adjust the signal generator level until the power meter reads 0 dBm ± 0.05 dB. Remove the power meter connection and reconnect the cable to the test set TNC socket.

(20) Adjust AE6 R140 for a power indication of 0 dBm ± 0.1 dB on the test set.

Spectrum analyzer adjustment (AE6/2 board) (C137, C142, R157, R140 and R141)

(1) Press [HELP SET-UP], *[Marconi Access], [PROD'N VALUES], [Prod Values].* Check that No Log Amp Cal Data is displayed beside the *[Log Amp Data]* soft key; if not, press *[Log Amp Data]* to display it.

(2) Press [HELP SET-UP], *[RESET].* The test set should power up in its default DUPLEX TEST mode.

(3) Press *[res BW up]* until the 3 MHz bandwidth is selected and, using the relevant soft keys beneath the display, set a span of 1 MHz/div.

(4) Press [Tx] [LEVEL], then, using the VARIABLE rotary control, adjust the spectrum analyzer reference level to place the peak of the signal within the top graticule. Press *[dB per div]* to select 1 dB/div.

(5) Adjust both C137 and C142 until the signal on the display is at maximum amplitude and is centred on the dotted graticule line. **Note:** C137 and C142 are interactive.

(6) Press [HELP SET-UP], *[RESET].*

(7) Set the test set as follows:- [Tx TEST], [RF SELECT] TNC input. Press *[IF BW]* until the 3 MHz IF filter is selected, press *[power BW]* to select IN BAND, [Tx], [FREQ] 101 [MHz], *[spec ana], [▼ ref level ▲]* 0 dBm (using the soft keys beneath the screen), *[bar charts].*

(8) Connect a signal generator set to provide –20 dBm at 101 MHz to the TNC RF input socket of the test set.

(9) Using a zero loss probe and external spectrum analyzer, measure the power level at 10.7 MHz entering the log amp input filter by monitoring the leg of variable capacitor C142 that is furthest from the screening can. Adjust R157 until the level displayed on the external analyzer indicates –11 dBm. (If you are using an MI 2388 zero loss probe, set this to provide 10 dB of attenuation and adjust R157 until the level seen on the external analyzer is –21 dBm.)

(10) Adjust C142 for a maximum power reading on the test set.

(11) Refit the RF lid to the receiver tray.

(12) Set the test set IF filter bandwidth to 110 kHz.

(13) Set the signal generator level to –10 dBm. Adjust R140 for –10 dBm ±0.5 dB on the test set display (the power is displayed on the top line of the display).

(14) Set the signal generator level to –50 dBm. Note the reading on the test set display. If this is not –50 dBm ±0.5 dB, adjust R141 for twice the noted error. For example, if the reading is –51 dBm, adjust R141 for a reading of –52 dBm; this ensures that R141 is adjusted in the correct direction.

(15) Repeat the adjustment of R140 and R141 (steps (13) and (14)) until both are within 0.5 dB of their respective levels (–10 dBm & –50 dBm).

(16) Changing the signal generator level in 10 dB steps, check the linearity of the log amp between –50 dBm and –10 dBm. Each 10 dB step should be within ±1.5 dB. If necessary, readjust R140 & R141.

(17) Press [HELP SET-UP], *[Marconi Access], [cal values], [spec ana], [default data], [store data],* [HELP SET-UP], *[RESET].*

(18) Press [HELP SET-UP], *[Marconi Access], [cal values], [spec ana], [cal config].*

(19) On the CAL VALUES : SPEC ANA CONFIG screen, switch all cals OFF except the *[INPUT FILTER]* cal; this should be set to ON.

(20) Press *[return], [CAL].*

(21) Wait approximately 1 minute for the Rx system cal to finish.

(22) Press *[store data], [return].*

(23) Verify that the text beneath the WARNINGS annotation is None; if not, repeat the calibration procedure.

(24) Press [HELP SET-UP], *[RESET].*

(25) Set the following on the test set; [Tx TEST], [RF SELECT] TNC input, [Tx], [FREQ] 101 [MHz], *[spec ana], [▼ ref level ▲]* +10 dBm, *[bar charts], [IF BW]* to select 3 MHz, *[power BW]* to select IN BAND.

(26) Set the external signal generator to 101 MHz, 0 dBm. To ensure that the level supplied to the test set is as close to 0 dBm as possible, disconnect the lead from the test set TNC RF socket and temporarily connect it to a power meter (e.g. MI 6960/ 6912) and adjust the signal generator level until the power meter reads 0 dBm ± 0.05 dB. Remove the power meter connection and reconnect the cable to the test set TNC socket.

(27) Adjust R140 for a power indication of 0 dBm ± 0.1 dB on the test set.

Spectrum analyzer crystal filter manual adjustments (AE6 and AE6/2 boards) (C4, C18, C34, C48, C65, C13, C25, C42, C55, C70, R9, R19, R32, R42, R55)

Note

Once the crystal filters have been set up in the factory, there should be no need to readjust them unless repairs are carried out on the board in the crystal filter area. Adjustments should only be made if it is not possible to achieve the correct filter response by carrying out the manual software adjustment via the diagnostics screen. Before starting these adjustments, ensure that R140, R141, and R157 have been set up (R140 and R141 should be rechecked after carrying out these filter adjustments).

(1) Disconnect the link between TP15 and the TR13 emitter. On some boards, this link will be on top of the board, on others it will be underneath.

(2) Turn on the test set and leave it for a minimum of thirty minutes.

(3) Using a short cable, connect the TNC RF socket to the N-type RF socket.

(4) Press [DUPLEX TEST], use [RF SELECT] to set the TNC socket to 1-port duplex, then press [RF GEN], [FREQ] 150 [MHz], [LEVEL] –22 [dBm], [Tx], [FREQ] 150 [MHz]. Select *[Rx mod OFF]*, then press [HELP SET-UP], *[Marconi Access]*, *[PROD'N VALUES]*, *[Specana diag]*, set a span of 500Hz/div, *[▼ ref level ▲]* –10 dBm, *[dB per div]* 10 dB. Finally, press *[change filter]* until the 300 Hz filter is selected.

(5) The title bar is split into four sections, each of which contains the name and current value of one of the crystal filter parameters:

Δ C.F.	Centre frequency adjustment.
STRAYS	Null strays adjustment.
BWIDTH	Bandwidth adjustment.
δ GAIN	Filter gain adjustment.

Each of these parameters can be adjusted up and down by using increment/decrement keys. The null strays and bandwidth soft keys are on the right. The ΔFREQ increment/decrement keys are assigned to the centre frequency adjustment. The δ increment/decrement keys are used for gain adjustments. Each of these parameters has a range of 0 to 4095, and there is an associated soft key INC: which can be used to change the increment size in the sequence 1, 10, 100, 200.

Using the appropriate keys, initially set the following values:-

Δ C.F.	2048
STRAYS	2048
BWIDTH	4095
δ GAIN	200

(6) *1st stage, 1st part.* Link TP15 to TP2 (connector length must not exceed 10cm). Set BWIDTH to 4095 (just –1 from 0) and set 500 Hz/div. Adjust C4 to centralise the peak of the response in the display. This should be very close to maximum amplitude. *See Fig 3-2.*

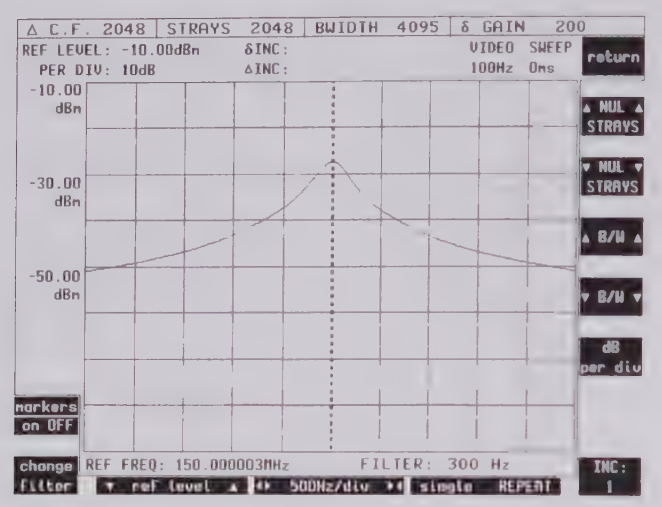

Fig. 3-2 Using C4 to centralise the peak response

(7) *1st stage, 2nd part.* Set 50 kHz/div, BWIDTH to 0. Adjust C13 for a minimum level. This will coincide with the resultant display having a flat band-pass response. Adjust R9 for best symmetry on the skirts of the response. *See Fig 3-3.*

Note: These two controls, C13 and R9, interact very strongly.

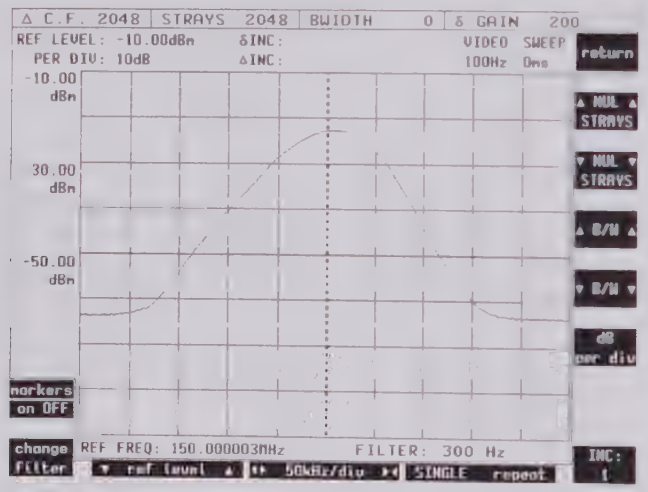

Fig. 3-3 Typical response when set up - 1st stage, 2nd part

If necessary, set dB/div to 2 dB for final adjustment. Effects of adjustment. C13 adjusts the flat portion at the top of the curve and R9 adjusts for equal spacing from the vertical centre line.

(8) *2nd stage, 1st part.* Remove the link from TP2 and connect it to TP3 (now TP15 to TP3). Set 500 Hz/div, BWIDTH to 4095. Adjust C18 to set peak of response to centre of screen. *See Fig 3-4.*

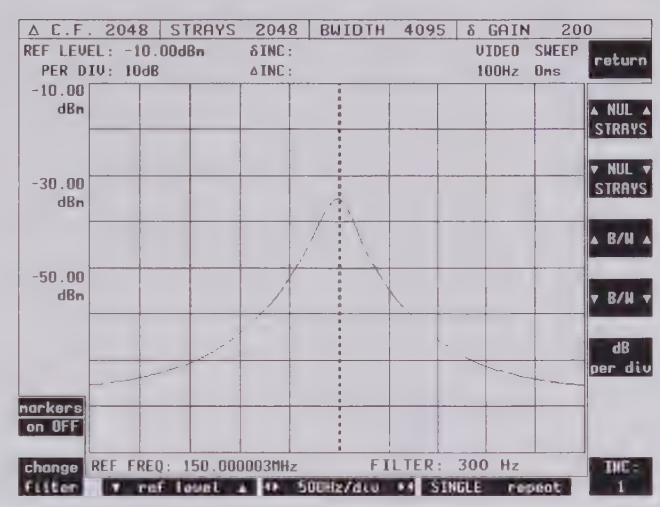

Fig. 3-4 Typical response - 2nd stage, 1st part

(9) *2nd stage, 2nd part.* Set 50 kHz/div, BWIDTH to 0. Adjust C25 for minimum level and flatness. Adjust R19 for best symmetry, as in *1st stage, 2nd part. See Fig 3-5.*

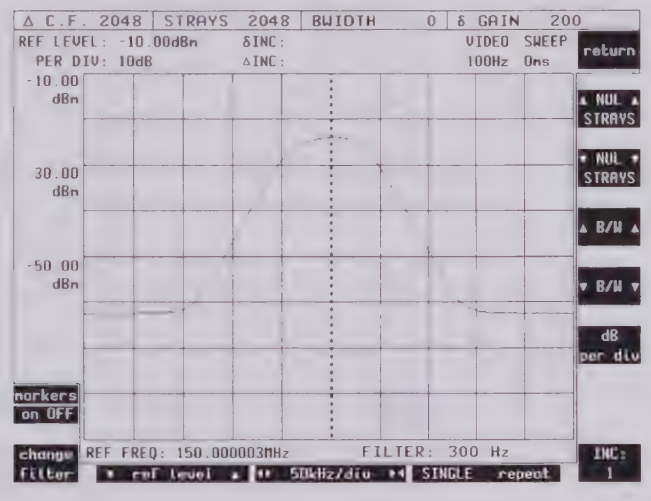

Fig. 3-5 Typical response - 2nd stage, 2nd part

(10) *3rd stage, 1st part.* Remove the link from TP3 and connect it to TP4 (TP15 - TP4). Set 500 Hz/div, BWIDTH to 4095. Adjust C34 to set peak of response in centre of screen. This will now start to coincide with the maximum amplitude. *See Fig 3-6.*

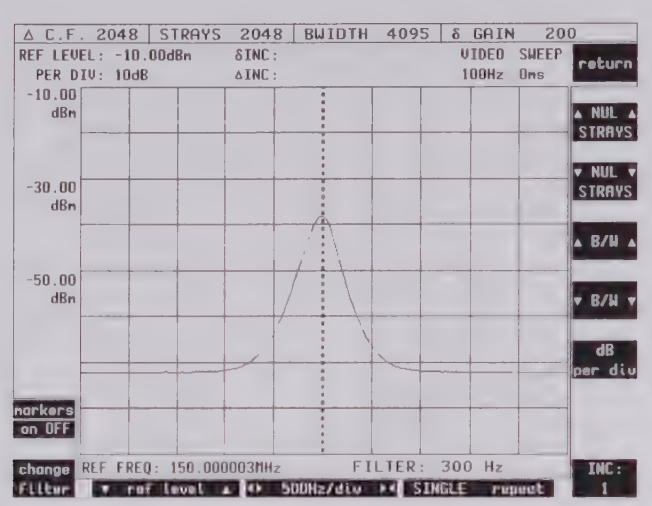

Fig. 3-6 Typical response - 3rd stage, 1st part

(11) *3rd stage, 2nd part.* Set 50 kHz/div, BWIDTH to 0. Adjust C42 for minimum level/flatness. Adjust R32 for best symmetry. *See Fig 3-7.*

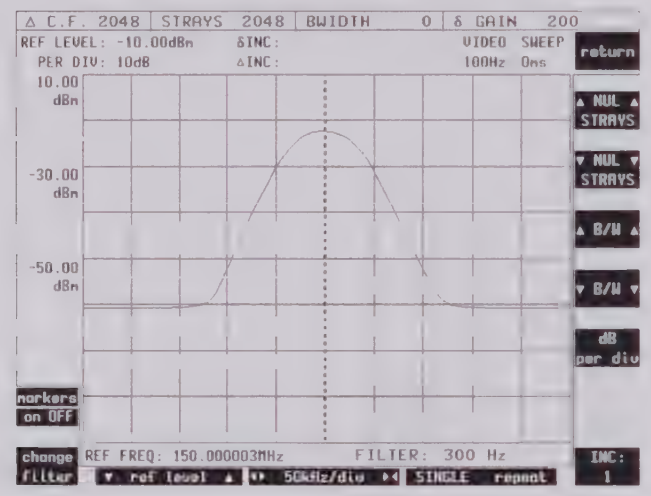

Fig. 3-7 Typical response - 3rd stage, 2nd part

(12) *4th stage, 1st part.* Remove link from the TP4 and connect to TP5 (TP15 to TP5). Set 500 Hz/div, BWIDTH to 4095. Adjust C48 to set peak at maximum amplitude. This may not coincide with the centre of the screen. *See Fig 3-8.*

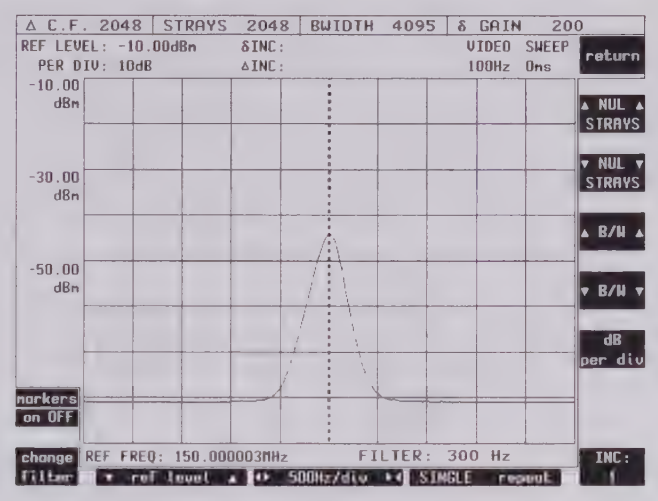

Fig. 3-8 Typical response - 4th stage, 1st part

(13) *4th stage, 2nd part.* Set 50 kHz/div, BWIDTH to 0. Adjust C55 for minimum level. Response no longer flat. Adjust R42 for best symmetry. *See Fig 3-9.*

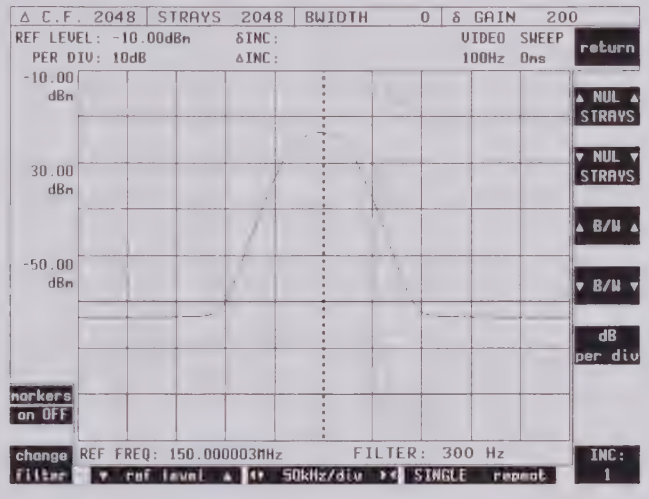

Fig. 3-9 Typical response - 4th stage, 2nd part

(14) *5th stage, 1st part.* Remove link from TP5 and TP15. Switch off test set and reconnect wire link between TP15 and TR13 emitter. Turn on and leave to warm up for 5 minutes. Set test set controls as in steps 4 and 5. Set 500 Hz/div, BWIDTH to 4095. Adjust C65 to set peak at maximum amplitude. *See Fig. 3-10.*

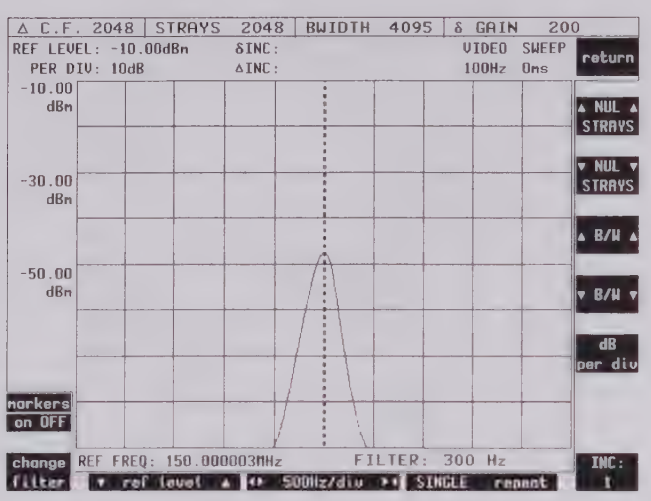

Fig. 3-10 Typical response - 5th stage, 1st part

(15) *5th stage, 2nd part.* Set 50 kHz/div, BWIDTH to 0. Adjust C70 for minimum level. Adjust R55 for best symmetry. *See Fig 3-11.*

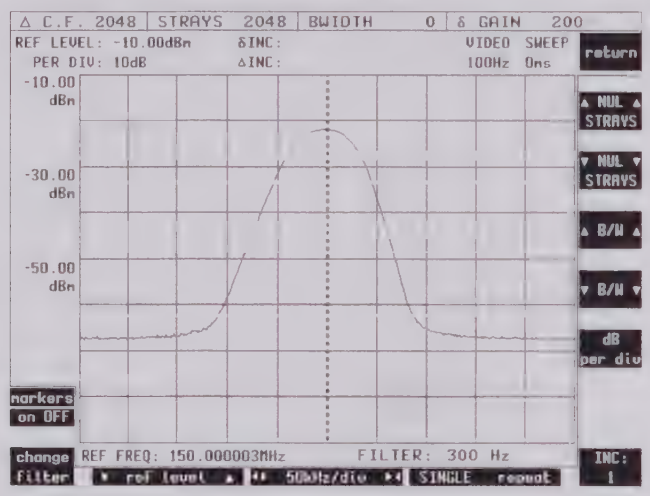

Fig. 3-11 Typical response - 5th stage, 2nd part

(16) Once manual adjustment is complete, exit from the diagnostic screen by pressing [HELP SET-UP], *[RESET].*

(17) Recheck the adjustment of R140, R141 and adjust if required. Carry out the spectrum analyzer crystal filter manual software adjustment. Then SA input filter calibration. Then SA cal.

Modulation meter FM & AM adjustment (AE7 board R84, R90, R145, and R116)

Note **The preliminary adjustments for the FM demodulator would only normally need to be carried out if repairs are carried out on AE7 or the board itself is replaced.**

Preliminary adjustments

(1) Set [Tx TEST], [Tx], [FREQ] 101 [MHz], [RF SELECT] TNC input, *[mod type]* until FM is selected, *[band pass]* until the 0.3-3.4 kHz filter is selected.

(2) Connect a signal generator (e.g. MI 2041) set to 10.7 MHz 0 dBm to PLC.

(3) Monitor PLE with a DVM set to measure DC Volts and adjust R84 for a reading of 0 V DC.

(4) Set the signal generator to provide 100 kHz deviation at 1 kHz modulation rate (set this up as accurately as possible by temporarily connecting to a modulation meter (e.g. MI 2305, accuracy 0.5%). Reconnect the signal generator to PLC, set the DVM to monitor AC Volts, and adjust R90 for 2 V RMS on PLE.

(5) Recheck R84 adjustment and optimise if required. Recheck R90 adjustment if R84 was readjusted.

(6) With the signal generator supplying 100 kHz deviation at 1 kHz modulation rate, pull the I^2C connector off PLB (this will prevent the board circuits from being auto-ranged).

(7) Set the signal generator modulation rate to 15 kHz.

(8) Adjust R145 for 2 V RMS on PLE.

(9) Remove the signal generator and reconnect PLC and PLB.

Final adjustments

The AM and FM absolute accuracy are controlled by two potentiometers on the AE7 board. These potentiometers are accessible via holes in the RF lid on the immediate underside of the unit. The underside outer casing will have to be removed. The audio & demod calibrations (page 3-5) must have been run prior to this set up.

(1) Press [RF TEST], *[RF IN/OUT]*. Toggle [RF SELECT] to set the test set to 2-port mode (TNC RF output, N-type input). Set [RF GEN], [FREQ] 150 [MHz], [LEVEL] 0 [dBm], [Tx], [FREQ] 150 [MHz], toggle *[Tx filter]* to select the 300 Hz LP filter.

(2) Using a T-piece, connect the TNC RF output to both the N-type input and an accurate external modulation meter (e.g. MI 2305). Set the external modulation meter to monitor FM in a 300 Hz to 3.4 kHz bandwidth with noise average ON.

(3) FM adjustment: Set [MOD GEN], [LEVEL] 90 [kHz], [FREQ] 100 [Hz], and check that the external modulation meter deviation reading is 90 kHz ± 1 kHz (this is just to confirm that the highly accurate fractional-N circuit of the test set Signal Generator is functioning, as it is used as the reference for setting up the FM modulation meter, *not* the MI 2305 reading.).

(4) Adjust AE7 R90 until the test set Tx FM DEVN display indicates 90.0 kHz +0, –0.1 kHz.

(5) AM adjustment:- Set the external modulation meter to read AM in a 300 Hz-3.4 kHz bandwidth. Press the *[Tx filter]* soft key to select the 5 kHz LP filter (displayed on the Tx side of the screen). Press [MOD GEN], [FREQ] 1 [kHz], [LEVEL] 80 [%], [INC] 0.1 [%] and, using the delta keys, adjust the modulation generator level until exactly 80% AM is indicated on the external modulation meter.

(6) Wait for the readings to settle, then press *[hold ranges]*. Set MOD 1 to OFF and note the residual noise reading on the AM DEPTH readout (Tx side of the test set display).

(7) Set MOD 1 to ON and adjust R116 on AE7 until 80% + noted residual noise figure is indicated on the Tx AM DEPTH readout. For example, if residual noise was 0.3%, set the indicated depth to 80.3%.

Signal generator AM distortion adjustment (AF5 board R58)

(1) Hinge the RF tray to gain access to the AF5 board.

(2) Connect a modulation meter (e.g. MI 2305) to the signal generator output from AF5, i.e. the SMA connector on the tray wall.

(3) On the test set, select [Rx TEST], [RF GEN], [FREQ] 400 [MHz], [RF SELECT] TNC output, [LEVEL] 3 dBm, [MOD GEN], [FREQ] 100 [Hz], [LEVEL] 85 [%].

(4) Set the modulation meter to monitor AM with a bandwidth of 30 Hz to 50 kHz, and noise averaging ON. If an MI 2305 is being used, set the LF output control knob to the marker.

(5) Connect a distortion meter to the modulation meter LF output and tune to 100 Hz.

(6) Adjust R58 on AF5 for minimum distortion.

Chapter 4
SELF-CALIBRATION INFORMATION

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Audio processor (A2/A3) calibrations

ADC offset calibration procedure

Purpose

This calibration is used to find the output value of the ADC on A2 that corresponds to 0 V input to the ADC.

Description

This calibration works by grounding the A2/A3 CAL path, routeing this ground signal to the input of the ADC, then reading the ADC output.

Calibration procedure

```
        INITIALISATION
1       Ground input to A2 ADC
1       Screen message: "ADC offset initialised"
1       #BP 10000

        START ADC READINGS
2       Request A2 ADC reading
2       Screen message: "Requesting first ADC offset reading"

        RECEIVE ADC READINGS
3       ADC READING RETURNED
3       #BP 10001
3       Screen message: "Offset reading X = XXXX"
3       IF more readings to be taken
4               Request ADC reading
4               REPEAT from section 3
3       ELSE all readings have been done
5               Calculate average ADC reading
5               IF offset in range 2039 - 2057
6                       Screen message "ADC offset passed"
6                       #BP 10002
5               ELSE ADC offset CAL failed
7                       Screen message "ADC offset failed"
7                       #BP 10003
3       END

CAL FAILURE: #BP 10003
```

ADC gain calibration procedure

Purpose

This calibration is used to establish the gain of the ADC on A2.

Description

This calibration is performed by routeing the +1 V reference, via the A2/A3 CAL path, to the input of the ADC on A2, and then reading the output of the ADC. This gives the ADC gain in bits/volt.

Calibration procedure

```
        INITIALISATION
1       Ground A1 AFREF signal
1       Route 1 V DC reference to A2/A3 CAL signal
1       Select CAL signal as input to A2 ADC
1       Screen message: "Initialised ADC gain CAL"
1       #BP #10000

        START ADC READINGS
2       Request A2 ADC reading
2       Screen message: "Start first ADC read"

        RECEIVE ADC READINGS
3       ADC READING RETURNED
3       #BP 10010
3       Screen message: "ADC (gain) reading X = XXXX"
3       IF more readings to be taken
4               Request ADC reading
4               REPEAT from section 3
3       ELSE all readings have been done
5               Calculate average ADC reading
5               IF 1 V reading in range 817 - 821
6                       Screen message "ADC gain passed"
6                       #BP 10011
5               ELSE ADC CAL CAL failed
7                       Screen message "ADC gain failed"
7                       #BP 10012
3       END
```

CAL FAILURE: #BP 10012

RMS-DC and DC filter offsets

Purpose

The purpose of this calibration is to measure the DC offsets presented to the A2 ADC input by the filtered and unfiltered outputs of the RMS-to-DC converter. Once they are known, the offsets can be applied to readings taken by the ADC to compensate for the DC offsets from the RMS-to-DC converter.

Description

This calibration is performed by grounding the input to the RMS-to-DC converter, using the A2/A3 CAL path. The filtered and unfiltered outputs of the RMS-to-DC converter are selected in turn and the ADC output is read. The differences between these readings and the true ground value of the ADC gives numerical offsets which can be applied to ADC readings taken from the RMS-to-DC converter.

Limits on these offsets: –6 <= offset <= +6

Calibration procedure

```
        INITIALISATION
1       Ground A1 AFREF signal
1       Select GROUND as A2/A3 CAL signal
1       Select CAL signal as input to RMS-DC converter
1       Select 10 Hz filter output as input to ADC
1       Screen message: "DC FILT/RMS offset initialised"
1       #BP 10000
```

```
        START ADC READINGS
2       Request A2 ADC reading
2       Screen message: "Requesting first ADC offset reading"
        RECEIVE ADC READINGS
3       ADC READING RETURNED
3       #BP 10020
3       Screen message: "Offset reading X = XXXX"
3       IF more readings to be taken
4               Request ADC reading
4               REPEAT from section 3
3       ELSE all readings have been done
5               Calculate average ADC reading
5               IF 10 Hz filter output selected as ADC input
6                       Select RMS-DC converter filtered output as input to ADC
6                       Screen message: "DC filt offset = XXXX, start RMS offset"
6                       Request ADC reading
6                       REPEAT from section 3
3       IF both offsets outside limits
7               Screen message: "RMS/DC FILT offsets, both failed"
7               Flag CAL as failed
7               #BP 10021
3       IF RMS-DC output offset outside limits
8               Screen message: "RMS offset failed"
8               Flag CAL as failed
8               #BP 10022
3       IF RMS-DC filtered output offset outside limits
9               Screen message: "DC FILTER offset failed"
9               Flag CAL as failed
9               #BP 10023
3       ELSE CAL has passed
10              Screen message: "RMS/DC FILT offsets passed"
10              Flag CAL as passed
10              #BP 10024
3       END
```

CAL FAILURE #BP 10021, 10022, 10023

RMS-DC and DC filter gain calibration procedure

Purpose

The purpose of this calibration is to measure the gains of the A2 RMS-to-DC converter when used with filtered and unfiltered output. Once the gains are known, they can be used to correct ADC readings for gain errors in the RMS-to-DC converter and its output paths.

Description

This calibration is performed by routeing the +1 V reference signal to the input of the RMS-to-DC converter, using the A2/A3 CAL path. The filtered and unfiltered outputs of the RMS-to-DC converter are selected in turn and the ADC output is read. The readings are corrected for offsets and the gain of each path can be calculated, since the gain of the ADC itself is known.

Calibration procedure

```
        INITIALISATION
1       Ground A1 AFREF signal
1       Select 1V DC reference as A2/A3 CAL signal
1       Select CAL signal as input to RMS-DC converter
1       Select 10 Hz filter output as input to ADC
1       Screen message: "Initialised RMS/DC FILTER gain"
1       #BP 10000

        START ADC READINGS
2       Request A2 ADC reading
2       Screen message: "Requesting first ADC offset reading"

        RECEIVE ADC READINGS
3       ADC READING RETURNED
3       #BP 10030
3       Screen message: "ADC reading X = XXXX"
3       IF more readings to be taken
4               Request ADC reading
4               REPEAT from section 3
3       ELSE all readings have been done
5               Calculate average ADC reading
5               IF 10 Hz filter output selected as ADC input
6                       Select RMS-DC converter filtered output as input to ADC
6                       Screen message: "DC filt gain = XXXX, start RMS gain"
6                       Request ADC reading
6                       REPEAT from section 3
3       IF both gains outside limits
7               Screen message: "RMS/DC FILT gains, both failed"
7               Flag CAL as failed
7               #BP 10031
3       IF RMS-DC gain outside limits
8               Screen message: "RMS gain failed";
8               Flag CAL as failed
8               #BP 10032
3       IF RMS-DC filtered output gain outside limits
9               Screen message: "DC FILTER gain failed";
9               Flag CAL as failed
9               #BP 10033
3       ELSE CAL has passed
10              Screen message: "RMS/DC FILT gains passed"
10              Flag CAL as passed
10              #BP 10034
3       END

CAL FAILURE #BP 10031, 10032, 10033
```

Peak detectors offset calibration

Purpose

The purpose of this calibration is to find peak detector reading offsets with which to compensate for DC offsets in the peak detectors.

Description

This calibration works by grounding the A2/A3 CAL path and routeing it to the input of the peak detectors on A2. The positive and negative peak detectors are then read. The readings returned are offset values for the detectors.

Limits on the offsets: 0 <= offset <= 24

Calibration procedure

```
        INITIALISATION
1       Ground A1 AFREF signal
1       Select GROUND as A2/A3 CAL signal
1       Select CAL signal as input to A3 demod path
1       Set maximum attenuation (25.5 dB) in A3 demod programmable gain stage
1       Select positive peak detector
1       Route CAL signal to peak detectors input
1       Screen message: "Initialised pk dets offset"
1       #BP 10000

        START PEAK DETECTOR READINGS
2       Request A2 peak detector reading
2       Screen message: "Reading pos peak detector"

        RECEIVE PEAK DETECTOR READINGS
3       PEAK DETECTOR READING RETURNED
3       #BP 10040
3       Screen message: "Pos/Neg peak reading X = XXXX"
3       IF more readings to be taken
4               Request peak detector reading
4               REPEAT from section 3
3       ELSE all readings have been done
5               Calculate average peak detector reading
5               IF positive peak detector selected
6                       Select negative peak detector
6                       Screen message: "Pos pk offset = XXXX, start neg pk"
6                       Request peak detector reading
6                       REPEAT from section 3
3       IF both offsets outside limits
7               Screen message: "Failed offset CAL on both peak detectors";
7               Flag CAL as failed
7               #BP 10041
3       IF RMS-DC output offset outside limits
8               Screen message: "Failed offset CAL on neg peak detector";
8               Flag CAL as failed
8               #BP 10042
3       IF RMS-DC filtered output offset outside limits
9               Screen message: "Failed offset CAL on pos peak detector");
9               Flag CAL as failed
9               #BP 10043
```

3 ELSE CAL has passed
10 Screen message: "Peak detectors offset passed";
10 Flag CAL as passed
10 #BP 10044
3 END

CAL FAILURE #BP 10041, 10042, 10043

Negative peak detector gain calibration procedure

Purpose

To calibrate the gain of the negative peak detector.

Description

This calibration measures the gain of the negative peak detector by routeing –2 V DC from A1 via the CAL path to the peak detectors input with the negative peak detector selected. The peak detector output is then read and the gain calculated in bits/volt.

Calibration procedure

INITIALISATION
1 Set –2 V DC on AFREF signal
1 Select AFREF as A2/A3 CAL signal
1 Select CAL signal as input to A2 ADC
1 Select CAL signal as input to A3 demod path
1 Set maximum attenuation (25.5 dB) in A3 demod programmable-gain stage
1 Route CAL signal to peak detectors input
1 Screen message: "Initialised neg peak gain CAL"
1 #BP 10000

START ADC REFERENCE READINGS
2 Request A2 ADC reading
2 Screen message "Start –2V reading"

RECEIVE ADC READINGS
3 ADC READING RETURNED
3 #BP 10060
3 Screen message: "–2V reading X = XXXX"
3 IF more readings to be taken
4 Request ADC reading
4 REPEAT from section 3
3 ELSE all readings have been done
5 Calculate average ADC reading
5 Select negative peak detector
5 Select CAL signal as input to peak detectors
5 Request A2 peak detector reading
5 Screen message: "Start first neg gain reading

RECEIVE PEAK DETECTOR READINGS
6 PEAK DETECTOR READING RETURNED
6 #BP 10061
6 Screen message: "–2V reading X = XXXX"
6 IF more readings to be taken
7 Request peak detector reading
7 REPEAT from section 6
6 ELSE all readings have been done
8 Calculate average peak detector reading
8 IF reading in range 1640 - 1740
9 Screen message "Neg pk gain CAL passed"

```
9                   #BP 10062
8             ELSE negative peak detector gain CAL failed
10            Screen message "Neg pk gain failed, xxxx"
10            #BP 10063
6       END

CAL FAILURE: #BP 10063
```

AF input offset DAC calibration procedure

Purpose

This calibration determines load values for the AF path input offset DAC on A3.

Description

The AF input attenuator on A3 has two settings, 0.9 dB and 40.9 dB. Each of these settings introduces a DC offset to the AF path. This calibration grounds the input to the attenuator, and, for each setting of the attenuator, performs a successive approximation on the AF path input offset DAC load value to determine the load values which exactly null these DC offsets.

Calibration procedure

```
        INITIALISATION
1       Ground AFREF signal
1       Select AF path output as input to RMS-DC converter
1       Ground A2/A3 CAL signal
1       Select AF NO FILTER, 30 V bar chart range
1       Route CAL signal to AF path input, AF input attenuation 40 dB
1       Select ADC input as 10 Hz filter output
1       Screen message "Initialised for af output offset, DAC A"
1       #BP 10000

        SET AF OUTPUT OFFSET DAC
2       SUCCESSIVE APPROXIMATION IN AF OFFSET DAC for ground reading at ADC
2       IF approximation has failed
3             Flag CAL as failed
3             #BP 10078
2       ELSE successive approximation was successful
2       #BP 10070

        FIND INPUT OFFSET DAC SETTING
4       Screen message: "Initialised AF high rnage offset CAL"
4       Range under test = 1 V bar chart
4       #BP 10071

        INITIALISE FOR INPUT OFFSET
5       Set bar chart range under test
5       #BP 10072

        SUCCESSIVE APPROXIMATION ON AF INPUT OFFSET DAC
6       Load test value into AF input offset DAC
6       Screen message: "Set af input offset DAC = xxxx"
6       #BP 10073
6       Screen message: "Measure AF input offset for DAC value xxxx"
6a      Request ADC reading
6       READING RETURNED
6       #BP 10074
6       Screen message: "AF input offset xxxx for DAC value = xxxx"
6       #BP 10075
6       IF more readings to be done
7             REPEAT from line marked 6a
```

```
6       ELSE all readings done
6       Calculate average offset reading
6       Screen message: "Found input offset = xxxx for DAC value xxxx"
6       Generate new test value for DAC
6       IF more bits to be tested in DAC load value
8               REPEAT section 6
6       ELSE approximation finished
9               IF approximation failed
10              Screen message: "AF input offset CAL failed"
10              #BP 10079
10              END
9               ELSE approximation successful
11              Save DAC setting in RAM
11              Load DAC value to DAC
11              Screen message: "Found (range) input offset DAC value = xxxx"
11              #BP
11              IF on 1 V bar chart range
12                      Set range under test to 10 mV bar chart range
12                      #BP 10076
12                      REPEAT from section 5
11              ELSE
13                      #BP 10077
13                      END
```

AF output offset DAC calibration

Purpose

This calibration establishes load values for the A3 AF path output offset DAC.

Description

This calibration works by grounding the input to the AF path on A3 by use of the A2/A3 CAL path. The load value of the output offset DAC is then adjusted to null out any DC offsets measured by the ADC on A2. Note that the band-pass filters are nulled on one range each only; this is because the filters are AC coupled in the last stage, so any DC offsets present are due to the output of the filters, not any of the gain stages prior to the filter.

The ADC load value is found by a successive approximation for each of the following hardware ranges, in the order given:-

Filter	AF bar chart range
NONE	30 mV
NONE	100 mV
NONE	300 mV
NONE	3 V
NONE	10 V
NONE	30 V
20 kHz low-pass	3 mV
20 kHz low-pass	10 mV
20 kHz low-pass	30 mV
20 kHz low-pass	100 mV
20 kHz low-pass	300 mV
20 kHz low-pass	1 V
20 kHz low-pass	10 V

Filter	AF bar chart range
20 kHz low-pass	30 V
300 Hz low-pass	10 mV
300 Hz low-pass	30 mV
300 Hz low-pass	100 mV
300 Hz low-pass	300 mV
300 Hz low-pass	1 V
300 Hz low-pass	10 V
300 Hz low-pass	30 V
0.3-3.4 kHz	10 mV
CMESS	10 mV
CCITT	10 mV

Calibration procedure

INITIALISATION
1 Select AF path output as input to RMS-DC converter
1 Ground A1 AFREF signal
1 Select 10 Hz filter output as input to A2 ADC
1 Ground A2/A3 CAL signal
1 Screen message: "AF output offset DAC CAL"
1 #BP 10000

SET UP FOR OFFSET CAL
2 Select filter for range under test
2 Set bar chart for range under test
2 Screen message: "(filter) (bar chart range)"
2 #BP 10080

SUCCESSIVE APPROXIMATION ON OUTPUT OFFSET DAC
3 IF CAL failed
4 Flag CAL as failed
4 #BP 10082
4 END
3 ELSE approximation successful
5 Save DAC setting
5 REPEAT from section 2 for next range
5 #BP 10083
3 WHEN all ranges done
6 Flag CAL as passed
6 #BP 10081
6 END

CAL FAILURE: #BP 10082

AF 1 V reference calibration procedure

Purpose

This calibration establishes a 1 V reference reading through the AF path on A2 and A3 to use in other calibrations.

Description

This calibration uses the 1 V DC reference voltage on A2, routed through the A3 AF path on the 1 V bar chart range gain settings with NO FILTER selected.

The level at the ADC on A2 is then measured to allow accurate calibration of the gain of the AF 1 V bar chart range.

Calibration procedure

```
        INITIALISATION
1       Route A3 demod path to demod path output switch
1       Select AF filter NO FILTER
1       Set AF 1 V bar chart range
1       Select CAL signal as input to AF path, 40 dB input attenuation
1       Select 1 V DC reference as A2/A3 CAL signal
1       Set AF input offset DAC
1       Set AF output offset DAC
1       Screen message: "Starting AF_1V calibration"
1       #BP 10000

        START AF 1 V CAL
2       Request ADC reading
2       Screen message: "Started AF_1VOLT, CAL - +1V, 1V range"

        CALCULATE AF 1 V READING
3       ADC READING RETURNED
3       #BP 10090
3       Screen message: "AF_1VOLT reading x = xxxx"
3       IF more readings to take
4               Request ADC reading
4               REPEAT from section 3
3       ELSE all readings done
5               Calculate AF 1 V reading
5               Screen message: "Found af_1V = xxxx.xxxx"
5               IF af_1V outside limits (1638 +/- 100)
6                       Screen message: "Error! af_1V out of range,
                        using default"
6                       Flag CAL as failed
6                       #BP 10092
5               #BP
5               ELSE
7                       Flag CAL as passed
7                       #BP 10091
5               END
```

Calibration of AF 20 dB and ÷3 stages

Purpose

This calibration is used to calculate the gains of the 20 dB amplifier and the ÷3 divider in the AF filter path on A3.

Description

The output from the AF path is routed to the FFT on A5 via the switch on the demod path output on A3. A1 is used to generate signals at 1 kHz which are measured with the stages in their 0 dB / 20 dB and ÷1/÷3 configurations to calculate their gains. The gains are calculated relative to the 0 dB and ÷1 settings which are normalised by the AF 1 V reference calibration.

Calibration procedure

	INITIALISATION
1	Set FFT for AF calibration (see description)
1	Route A3 AF path output to A2 via A3 demod path output switch
1	Select AF filter NO FILTER
1	Select AF bar chart 1 V range
1	Select CAL signal as AF path input on A3, 40 dB input attenuation
1	Set A1 CAL signal AFREF = 400 mV RMS @ 1kHz
1	Select AFREF as A2/A3 CAL signal
1	Screen message: "Initialised for 0/20 dB CAL"
1	#BP 10000
	REQUEST READING FOR 1 V RANGE
2	Request peak find and marker reading on FFT
2	Screen message: "Made peak find request"
	READ 1 V RANGE LEVEL
3	MARKER LEVEL READING RETURNED
3	#BP 10110
3	Record 1 V range reading
3	Screen message: "1 V range reading = xxxx"
3	Set 10 V AF bar chart range
3	Select CAL signal as AF path input on A3, 40 dB input attenuation
3	#BP 10111
	GET READING FOR 10 V RANGE
4	Request marker reading
4	MARKER LEVEL READING RETURNED
4	#BP 10112
4	Record 10 V range reading
4	Calculate gain of 20 dB amp stage (nominal value 0.1)
4	Screen message: "af_amp_gain [0] = x.xxxx"
4	IF gain error (limits +/- 0.01)
5	Flag CAL as failed
5	"Error! af_amp_gain [0] out of range, using default"
5	#BP 10113
5	END
4	ELSE 20 dB amp gain in range
4	Select AF 3 V bar chart range
4	#BP 10114
	MEASURE ÷1/÷3 STAGE GAIN
6	Request marker reading
6	MARKER LEVEL READING RETURNED
6	#BP 10115
6	Calculate divider gain (nominal value 0.3333)

6 Screen message: "af_div_gain [0] = x.xxxx"
6 IF gain in range (limits +/- 10%)
7 Flag CAL as passed
7 #BP 10116
6 ELSE divider gain CAL failed
8 Flag CAL as failed
8 Screen message: "Error! af_div_gain [0] out of range, using_default"
8 #BP 10117
6 Route A3 demod path to A3 demod output
6 END

CAL FAILURE: #BP 10113, 10117

AF input attenuator calibration

Purpose

This calibration is used to calculate the gain of the 40 dB attenuator at the input to the AF filter path on A3.

Description

The output from the AF path is routed to the FFT on A5 via the switch on the demod path output on A3. A1 is used to generate signals at 1 kHz which are measured with the attenuator in its 0 dB/ 40 dB configurations to calculate the gain of the 40 dB relative to the 0 dB setting, which is normalised by the AF 1 V reference calibration.

Calibration procedure

INITIALISATION
1 Set FFT for AF CAL
1 Route A3 AF path output to A2 via A3 demod path output switch
1 Select AF filter NO FILTER
1 Select AF bar chart 300 mV range
1 Select CAL signal as AF path input on A3, 40 dB input attenuation
1 Set A1 CAL signal AFREF = 120 mV RMS @ 1kHz
1 Select AFREF as A2/A3 CAL signal
1 Screen message: "Initialised for input attenuator CAL"
1 #BP 10000

GET 300 mV RANGE READING
2 Request peak find and marker reading on FFT
2 Screen message: "Made peak find request"
2 MARKER LEVEL READING RETURNED
2 #BP 10100
2 Screen message: "300 mV range reading = xxxx"
2 Set AF bar chart 30 V range
2 Select CAL signal as AF path input on A3, 0 dB input attenuation
2 #BP 10101

GET 30 V RANGE READING
3 Request marker reading
3 MARKER LEVEL READING RETURNED
3 #BP 10102
3 Calculate AF input attenuator gain (nominal value = 100)
3 Screen message: "af_ip_att_gain [0] = xxx.xxx"
3 IF attenuator gain in error (error limit 10%)
4 Flag CAL as failed
4 #BP 10104
4 Screen message: "Error! af_ip_att_gain [0] out of range, using default"
3 ELSE

5 Flag CAL as passed
5 #BP 10103
3 Route A3 demod path to A3 demod output
3 END

CAL FAILURE: #BP 10104

AF filter gain calibration

Purpose

This calibration is used to calculate the gains of the various filters which can be selected in the AF filter path on A3.

Description

The output from the AF path is routed to the FFT on A5 via the switch on the demod path output on A3. A1 is used to generate signals at various frequencies (unity gain points, see table below) which are measured with the FFT. The gains are calculated relative to readings found during this calibration for the AF filter NO FILTER selected. The NO FILTER gain is normalised by the AF 1 V reference calibration.

Index	Filter	Test frequency	FFT Ref Frequency	FFT Span / Div
0	20 kHz LP	6 kHz	5 kHz	1 kHz
1	300 Hz LP	100 Hz	500 Hz	100 Hz
2	BAND-PASS	1 kHz	1.250 kHz	250 Hz
3	CCITT	800 Hz	1.250 kHz	250 Hz
4	CMESS	1 kHz	1.250 kHz	250 Hz

Calibration procedure

INITIALISATION
1 Set FFT for AF CAL
1 Route AFREF to A2/A3 CAL signal
1 Route AF path output to FFT via A3 demod output switch
1 Set filter under test = 20 kHz low-pass
1 #BP 10000

INITIALISE FILTER FOR CAL
2 Select AF filter NO FILTER
2 Set AF 1 V bar chart range
2 Set FFT span and ref freq for filter under test
2 Set AFREF siganl level to 400 mV RMS
2 Set AFREF signal frequency for filter under test
2 Screen message: "Initialised for AF filters CAL"
2 #BP 11000 + FILTER INDEX (see description, above)

GET NO FILTER LEVEL
3 Request FFT marker peak find and marker level
3 Screen message: "Made peak find request"
3 READING RETURNED
3 #BP 11010 + FILTER INDEX
3 Screen message: "No filter: reading = xxxx"
3 Select filter under test as AF filter
3 #BP 11020 + FILTER INDEX

GET FILTER UNDER TEST LEVEL
4 Request marker reading
4 MARKER READING RETURNED

```
4       #BP 11030 + FILTER INDEX
4       Calculate filter gain
4       Screen message: "<filter>, gain = x.xxxx"
4       IF more filters to calibrate
5               #BP 11040 + FILTER INDEX
5               REPEAT from section 2 for next filter

        ALL FILTERS DONE
6       Select A3 demod path as A3 demod path output
6       Switch OFF FFT
6       #BP 11009
6       END
```

Demod filter calibration

Purpose

The purpose of this calibration is to find, for each demod audio filter, the output offset DAC setting values for each demod range, and the gain of that filter.

Description

This calibration works by finding, for each demod audio filter in turn, the output offset DAC settings and the filter gain. The filters calibrated are numbered as follows:-

Filter Nbr	Filter
0	NO FILTER
1	20 kHz low-pass
2	5 kHz low-pass
3	300 Hz low-pass
4	0.3-3.4 kHz
5	CMESS
6	CCITT

The offsets are found for each of the following demod range settings on A3, for NO FILTER and the low-pass filters. (Band-pass filters are only calibrated for the FM 1 kHz range since the output offset DAC settings are independent of range on the band-pass filters.)

Range Nbr	DEMOD RANGE
00	FM 1 kHz
01	FM 3 kHz
02	FM 10 kHz
03	FM 30 kHz
04	FM 100 kHz
05	FM 300 kHz
06	AM 10 %
07	AM 30 %
08	AM 100 %
09	PM 1 RAD
10	PM 3 RAD
11	PM 10 RAD
12	PM 30 RAD

Calibration procedure

```
1     Clear up display area
1     IF filter under test = NO FILTER
2           Select DC input to A2 ADC (RMS-DC converter bypassed)
2           Set demod path op offset DAC for NO FILTER, 1 kHz FM demod range
1     ELSE for all other filters
3           Select DC filter output as input to ADC on A2
1     Select demod path output as input to DC filter and RMS-DC converter on A2
1     Select demod path output as input to A2 peak detector
1     Route A2/A3 CAL signal to A3 demod path input
1     Ground A2/A3 CAL signal
1     Ground AFREF
1     #BP 10000

      CALIBRATE DEMOD OUTPUT OFFSET DAC SETTING
4     FIND FILTER OUTPUT OFFSET DAC SETTING
4     IF output offset approximation has failed
5           Flag CAL as failed
5           #BP 13XYY (where X is filter number, YY is range number, see above)
5           END
4     IF more demod ranges to find offset setting for
6           #BP 12XYY (where X is filter number, YY is range number, see above)
6           REPEAT from start of section 4 for next demod range
4     ELSE all output offsets done for filter under test
7     #BP 12X99 (where X is filter number, see above)

      CALIBRATE FILTER GAIN
8     FIND FILTER GAIN
8     IF gain measurement has failed
9           #BP 15X00 (where X is filter number, see above)
9           END
8     ELSE gain measurement successful
10          #BP 14X00 (where X is filter number, see above)
8     IF more filters to calibrate
11          REPEAT from section 4 for next filter
8     ELSE all filters calibrated
12          Screen message: "Demod filter CAL finished"
12          #BP 16000
12    END
```

CAL FAILURE: #BP 13XYY, #BP 15X00

where X is the filter number shown above and YY is the range number shown above

Demod no filter audio filter gain calibration

Purpose

The purpose of this calibration is to determine a gain correction value which can be used to correct demod measurements made with no demod audio filter selected.

Description

This calibration works by measuring, with the ADC on A2, the output from A3 when the A2/A3 + 1 V reference is routed through A3 with no demod audio filter selected. Comparison of the measurement with the expected reading yields the gain figure for the demod NO FILTER path.

Calibration procedure

```
        INITIALISATION
1       Select A2/A3 CAL signal as input to A3 demod path
1       Set demod path ÷1/÷3 divider stage to ÷1
1       Set demod path programmable gain/loss stage to 0 dB
1       Route +1 V reference to A2/A3 CAL signal
1       #BP 10000

        START NO FILTER GAIN MEASUREMENTS
2       Request ADC reading from A2
2       ADC READING RETURNED
2       #BP 16001
2       Screen message: "No filter gain reading x = xxxx"
2       IF more readings to take
3               REPEAT from start of section 2
2       ELSE all readings done
4               Calculate gain for demod NO FILTER
4               Screen message: "Found no filter gain = xx.xxxxx"
4               IF gain > 2.2  OR  gain < 1.8
5                       Screen message: "No filt gain over range, using
                        default"
5                       Flag CAL as failed
5                       #BP 15000
4               ELSE gain value OK
6                       Print gain value in table on screen
6                       Screen message: "x.xx"
6                       #BP 16002
2       END

CAL FAILURE: #BP 15000
```

Demod 20 kHz low-pass audio filter gain calibration

Purpose

The purpose of this calibration is to determine a gain correction value which can be used to correct demod measurements made with the 20 kHz low-pass audio filter selected.

Description

This calibration works by measuring a 1 V RMS, 1 kHz signal routed through the demod 20 kHz low-pass filter, to the FFT, and measuring the same signal routed through the demod path with NO FILTER selected. Given that the gain of the NO FILTER setting is known from the calibration "DEMOD NO FILTER AUDIO FILTER GAIN", the gain of the 20 kHz low-pass filter can be calculated.

Calibration procedure

```
        INITIALISATION
1       Select A2/A3 CAL signal as input to A3 demod path
1       Route A1 AF output to A2/A3 CAL signal via AFREF line
1       Select filtered output from RMS-DC converter as ADC input
1       Set AF generator frequency to 1 kHz
1       Set AF generator level to 1 V
1       Set demod path ÷1/÷3 divider stage to ÷1
1       Set demod path programmable gain/loss for 20 kHz LP filter, 10 kHz range
1       Route demod path output to scope/FFT output on A2
1       Route demod path output to speaker
1       Set FFT span 250 Hz/div
1       Set FFT vertical scale to 10 dB/div
```

```
1       Set demod scope gain –10.45 dB
1       Switch on FFT
1       Set FFT reference frequency = 1.05 kHz
1       Screen message: "Initialised for 20 kHz low pass gain"
1       #BP 10000

        START 1 kHz READING
2       Switch on marker 1 on FFT
2       Request marker peak find
2       Screen message: "Reading 20 kHz low pass @ 1kHz, 1V RMS"
2       FFT PEAK LEVEL READING RETURNED
2       #BP 16100
2       Screen message: "lp20k_1k = xxxx"
2       Set demod audio filter to NO FILTER
2       Set demod path programmable gain/loss for NO FILTER, 10 kHz range
2       #BP16101

        START 1 kHz NO FILTER reading
3       Request marker level reading
3       Screen message: "Reading no filter @ 1kHz, 1V RMS"
3       MARKER LEVEL READING RETURNED
3       #BP 16102
3       Screen message: "no_filt_1k = xxxx"
3       #BP 16103

        REPEAT 1 kHz NO FILTER reading
4       Request marker level reading
4       Screen message: "Reading no filter @ 1.0kHz, 1V RMS"
4       MARKER LEVEL READING RETURNED
4       #BP 16104
4       Screen message: "no_filt_10k = xxxx"
4       Set demod 20 kHz low-pass filter
4       Set demod path programmable gain/loss for 20 kHz LP filter, 10 kHz range
4       #BP 16105

        REPEAT 20 kHz FILTER 1 kHz reading
5       Request marker level reading
5       Screen message: "Reading 20kHz low pass @ 1.0kHz, 1V RMS"
5       MARKER LEVEL READING RETURNED
5       #BP 16106
5       Screen message: "lp20k_10k = xxxx"
5       Calculate filter gain
5       Screen message: "x.xx"
5       Print gain value into table on screen
5       Switch off FFT
5       IF gain > 2.2  OR gain < 1.8
6               Flag CAL as failed
6               Screen message: "20 kHz gain over range, using default"
6               #BP 15100
5       ELSE filter gain OK
7               #BP 16107
5       END

CAL FAILURE: #BP 15100
```

Demod 5 kHz low-pass audio filter gain calibration

Purpose

The purpose of this calibration is to determine a gain correction value which can be used to correct demod measurements made with the 5 kHz low-pass demod audio filter selected.

Description

This calibration works by measuring a 1 V RMS, 1 kHz signal routed through the demod 5 kHz low-pass filter, to the FFT, and measuring the same signal routed through the demod path with NO FILTER selected. Given that the gain of the NO FILTER setting is known from the calibration "DEMOD NO FILTER AUDIO FILTER GAIN", the gain of the 5 kHz low-pass filter can be calculated.

Calibration procedure

	INITIALISATION
1	Select A2/A3 CAL signal as input to A3 demod path
1	Route A1 AF output to A2/A3 CAL signal via AFREF line
1	Select filtered output from RMS-DC converter as ADC input
1	Set AF generator frequency to 1 kHz
1	Set AF generator level to 1 V
1	Set demod path ÷1/÷3 divider stage to ÷1
1	Set demod path programmable gain/loss for 5 kHz LP filter, 10 kHz range
1	Route demod path output to scope/FFT output on A2
1	Route demod path output to speaker
1	Set FFT span 250 Hz/div
1	Set FFT vertical scale to 10 dB/div
1	Set demod scope gain −10.45 dB
1	Switch on FFT
1	Set FFT reference frequency = 1.05 kHz
1	Screen message: "Initialised for 5 kHz low pass gain"
1	#BP 10000
	START 1 kHz READING
2	Switch on marker 1 on FFT
2	Request marker peak find
2	Screen message: "Reading 5 kHz low pass @ 1kHz, 1V RMS"
2	FFT PEAK LEVEL READING RETURNED
2	#BP 16200
2	Screen message: "lp5k_1k = xxxx"
2	Set demod audio filter to NO FILTER
2	Set demod path programmable gain/loss for NO FILTER, 10 kHz range
2	#BP 16201
	START 1 kHz NO FILTER READING
3	Request marker level reading
3	Screen message: "Reading no filter @ 1kHz, 1V RMS"
3	MARKER LEVEL READING RETURNED
3	#BP 16202
3	Screen message: "no_filt_1k = xxxx"
3	#BP 16203
	REPEAT 1 kHz NO FILTER reading
4	Request marker level reading
4	Screen message: "Reading no filter @ 1.0kHz, 1V RMS"
4	MARKER LEVEL READING RETURNED
4	#BP 16204
4	Screen message: "no_filt_10k = xxxx"
4	Set demod 5 kHz low-pass filter

4 Set demod path programmable gain/loss for 5 kHz LP filter, 10 kHz range
4 #BP 16205

REPEAT 5 kHz FILTER 1 kHz reading
5 Request marker level reading
5 Screen message: "Reading 5kHz low pass @ 1.0kHz, 1V RMS"
5 MARKER LEVEL READING RETURNED
5 #BP 16206
5 Screen message: "lp5k_10k = xxxx"
5 Calculate filter gain
5 Screen message: "x.xx"
5 Print gain value into table on screen
5 Switch off FFT
5 IF gain > 2.2 OR gain < 1.8
6 Flag CAL as failed
6 Screen message: "5 kHz gain over range, using default"
6 #BP 15200
5 ELSE filter gain OK
7 #BP 16207
5 END

CAL FAILURE: #BP 15200

Demod 300 Hz low-pass audio filter gain calibration

Purpose

The purpose of this calibration is to determine a gain correction value which can be used to correct demod measurements made with the 300 Hz low-pass demod audio filter selected.

Description

This calibration works by measuring a 1 V RMS, 100 Hz signal routed through the demod 300 Hz low-pass filter, to the FFT, and measuring the same signal routed through the demod path with NO FILTER selected. Given that the gain of the NO FILTER setting is known from the calibration "DEMOD NO FILTER AUDIO FILTER GAIN", the gain of the 300 Hz low-pass filter can be calculated.

Calibration procedure

INITIALISATION
1 Select A2/A3 CAL signal as input to A3 demod path
1 Route A1 AF output to A2/A3 CAL signal via AFREF line
1 Select filtered output from RMS-DC converter as ADC input
1 Set AF generator frequency to 100 Hz
1 Set AF generator level to 1 V
1 Set demod path ÷1/÷3 divider stage to ÷1
1 Set demod path programmable gain/loss for 300 Hz LP filter, 10 kHz range
1 Route demod path output to scope/FFT output on A2
1 Route demod path output to speaker
1 Set FFT span 50 Hz/div
1 Set FFT vertical scale to 10 dB/div
1 Set demod scope gain −10.45 dB
1 Switch on FFT
1 Set FFT reference frequency = 300 Hz
1 Screen message: "Initialised 300 Hz low pass gain CAL"
1 #BP 10000

```
        START 1 V READING
2       Switch on marker 1 on FFT
2       Request marker peak find
2       Screen message: "Requested 300 Hz / 1V reading"
2       FFT PEAK LEVEL READING RETURNED
2       #BP 16300
2       Screen message: "lp300 = xxxx"
2       Set demod audio filter to NO FILTER
2       Set demod path programmable gain/loss for NO FILTER, 10 kHz range
2       #BP 16301

        START 1 V NO FILTER READING
3       Request marker level reading
3       Screen message: "Requested no filter / 1V reading"
3       MARKER LEVEL READING RETURNED
3       #BP  16302
3       Calculate filter gain
3       Screen message: "300 Hz filter gain = x.xxxxxx"
3       Print gain value into table on screen
3       Switch off FFT
3       IF gain > 2.2  OR gain < 1.8
4               Flag CAL as failed
4               Screen message: "300 Hz gain over range, using default"
4               #BP 15300
3       ELSE filter gain OK
5               #BP 16303
3       END

CAL FAILURE: #BP 15300
```

Demod 0.3-3.4 kHz band-pass audio filter gain calibration

Purpose

The purpose of this calibration is to determine a gain correction value which can be used to correct demod measurements made with the 0.3-3.4 kHz demod audio filter selected.

Description

This calibration works by measuring a 1 V RMS, 1 kHz signal routed through the demod 0.3-3.4 kHz filter, to the FFT, and measuring the same signal routed through the demod path with NO FILTER selected. Given that the gain of the NO FILTER setting is known from the calibration "DEMOD NO FILTER AUDIO FILTER GAIN", the gain of the 0.3-3.4 kHz filter can be calculated.

Calibration procedure

```
        INITIALISATION
1       Select A2/A3 CAL signal as input to A3 demod path
1       Route A1 AF output to A2/A3 CAL signal via AFREF line
1       Select filtered output from RMS-DC converter as ADC input
1       Set AF generator frequency to 1 kHz
1       Set AF generator level to 1 V
1       Set demod path ÷1/÷3 divider stage to ÷1
1       Set demod path programmable gain/loss for 0.3-3.4 kHz filter, 10 kHz range
1       Route demod path output to scope/FFT output on A2
1       Route demod path output to speaker
1       Set FFT span 250 Hz/div
1       Set FFT vertical scale to 10 dB/div
1       Set demod scope gain –10.45 dB
```

```
1       Switch on FFT
1       Set FFT reference frequency = 1.05 kHz
1       Screen message: "Initialised for band-pass gain"
1       #BP 10000

        START 1 kHz READING
2       Switch on marker 1 on FFT
2       Request marker peak find
2       Screen message: "Reading band pass @ 1kHz, 1V RMS"
2       FFT PEAK LEVEL READING RETURNED
2       #BP 16400
2       Screen message: "1V @ 1 kHz, bp = xxxx"
2       Set demod audio filter to NO FILTER
2       Set demod path programmable gain/loss for NO FILTER, 10 kHz range
2       #BP 16401

        START 1 V NO FILTER READING
3       Request marker level reading
3       Screen message: "Reading no filter @ 1kHz, 1V RMS"
3       MARKER LEVEL READING RETURNED
3       #BP 16402
3       Calculate filter gain
3       Screen message: "x.xx"
3       Print gain value into table on screen
3       Switch off FFT
3       IF gain > 2.2  OR gain < 1.8
4               Flag CAL as failed
4               Screen message: "BP gain over range, using default"
4               #BP 15400
3       ELSE filter gain OK
5               #BP 16403
3       END

CAL FAILURE: #BP 15400
```

Demod CCITT audio filter gain calibration

Purpose

The purpose of this calibration is to determine a gain correction value which can be used to correct demod measurements made with the CCITT demod audio filter selected.

Description

This calibration works by measuring a 1 V RMS, 800 Hz signal routed through the demod CCITT filter, to the FFT, and measuring the same signal routed through the demod path with NO FILTER selected. Given that the gain of the NO FILTER setting is known from the calibration "DEMOD NO FILTER AUDIO FILTER GAIN", the gain of the CCITT filter can be calculated.

Calibration procedure

```
        INITIALISATION
1       Select A2/A3 CAL signal as input to A3 demod path
1       Route A1 AF output to A2/A3 CAL signal via AFREF line
1       Select filtered output from RMS-DC converter as ADC input
1       Set AF generator frequency to 800 Hz
1       Set AF generator level to 1 V
1       Set demod path ÷1/÷3 divider stage to ÷1
1       Set demod path programmable gain/loss for CCITT filter, 10 kHz range
1       Route demod path output to scope/FFT output on A2
1       Route demod path output to speaker
```

```
1       Set FFT span 250 Hz/div
1       Set FFT vertical scale to 10 dB/div
1       Set demod scope gain −10.45 dB
1       Switch on FFT
1       Set FFT reference frequency = 850 Hz
1       Screen message: "Initialised for CCITT band pass gain"
1       #BP 10000

        START 1 kHz READING
2       Switch on marker 1 on FFT
2       Request marker peak find
2       Screen message: "Reading CCITT @ 800 Hz, 1V RMS"
2       FFT PEAK LEVEL READING RETURNED
2       #BP 16600
2       Screen message: "1V @ 800 Hz, bp = xxxx"
2       Set demod audio filter to NO FILTER
2       Set demod path programmable gain/loss for NO FILTER, 10 kHz range
2       #BP 16601

        START 1 V NO FILTER READING
3       Request marker level reading
3       Screen message: "Reading no filter @ 800 Hz, 1V RMS"
3       MARKER LEVEL READING RETURNED
3       #BP 16602
3       Calculate filter gain
3       Screen message: "x.xx"
3       Print gain value into table on screen
3       Switch off FFT
3       IF gain > 2.2  OR gain < 1.8
4               Flag CAL as failed
4               Screen message: "CCITT gain over range, using default"
4               #BP 15600
3       ELSE filter gain OK
5               #BP 16603
3       END

CAL FAILURE: #BP 15600
```

Demod CMESS audio filter gain calibration

Purpose

The purpose of this calibration is to determine a gain correction value which can be used to correct demod measurements made with the CMESS demod audio filter selected.

Description

This calibration works by measuring a 1 V RMS, 1 kHz signal routed through the demod CMESS filter, to the FFT, and measuring the same signal routed through the demod path with NO FILTER selected. Given that the gain of the NO FILTER setting is known from the calibration "DEMOD NO FILTER AUDIO FILTER GAIN", the gain of the CMESS filter can be calculated.

Calibration procedure

```
        INITIALISATION
1       Select A2/A3 CAL signal as input to A3 demod path
1       Route A1 AF output to A2/A3 CAL signal via AFREF line
1       Select filtered output from RMS-DC converter as ADC input
1       Set AF generator frequency to 1 kHz
1       Set AF generator level to 1 V
1       Set demod path ÷1/÷3 divider stage to ÷1
```

```
1       Set demod path programmable gain/loss for CMESS filter, 10 kHz range
1       Route demod path output to scope/FFT output on A2
1       Route demod path output to speaker
1       Set FFT span 250 Hz/div
1       Set FFT vertical scale to 10 dB/div
1       Set demod scope gain –10.45 dB
1       Switch on FFT
1       Set FFT reference frequency = 1.05 kHz
1       Screen message: "Initialised for CMESS band pass gain"
1       #BP 10000

        START 1 kHz READING
2       Switch on marker 1 on FFT
2       Request marker peak find
2       Screen message: "Reading CMESS @ 1kHz, 1V RMS"
2       FFT PEAK LEVEL READING RETURNED
2       #BP 16500
2       Screen message: "1V @ 1 kHz, bp = xxxx"
2       Set demod audio filter to NO FILTER
2       Set demod path programmable gain/loss for NO FILTER, 10 kHz range
2       #BP 16501

        START 1 V NO FILTER READING
3       Request marker level reading
3       Screen message: "Reading no filter @ 1kHz, 1V RMS"
3       MARKER LEVEL READING RETURNED
3       #BP 16502
3       Calculate filter gain
3       Screen message: "x.xx"
3       Print gain value into table on screen
3       Switch off FFT
3       IF gain > 2.2  OR gain < 1.8
4               Flag CAL as failed
4               Screen message: "CMESS gain over range, using default"
4               #BP 15500
3       ELSE filter gain OK
5               #BP 16503
3       END

CAL FAILURE: #BP 15500
```

Demod noise calibration

Purpose

The purpose of this calibration is to calculate the residual noise content for measurements of FM deviation in all filter and demod range configurations, so that the residual noise can be eliminated from each reading to improve tha accuracy of the FM demod measurement.

Description

This calibration works by setting up a deviation on the signal generator for each hardware range and demod filter. These deviations are set up at the unity gain frequency of each of the filters. The relatively noise-free 300 Hz low-pass filter readings are taken to be absolute, since the 1-bit ADC FM generation is accurate at 100 Hz (test frequency for the 300 Hz filter). When all measurements are done, the residual noise for each filter/range combination measurement is reckoned to be the difference between the reading for that filter and range, and the reading for tha same range on the 300 Hz filter.

The following tables show the test frequencies for each filter and the FM deviation settings used for each range, along with the maximum correction allowable for those ranges.

Filter Index	Filter	Test frequency (kHz)
1	LOW-PASS 20 kHz	1.0
2	LOW-PASS 5 kHz	1.0
3	LOW-PASS 300 Hz	0.1
4	BAND-PASS	1.0
5	CMESS	1.0
6	CCITT	0.8

Barchart		Test level (kHz)	Max correction (kHz)
Index	Range		
0	3 kHz	2.7	0.5
1	10 kHz	9.0	1.5
2	30 kHz	27.0	5.0
3	100 kHz	90.0	15.0

Calibration procedure

INITIALISATION
1 Set all noise corrections to 0
1 Test filter = 20 kHz low-pass
1 Select single-port duplex mode on N-type connector
1 Set RF gen freq and receiver freq to 150 MHz
1 Switch RF generator on
1 Set RF generator level –27 dBm at N-type connector
1 Select 280 kHz IF filter
1 Set 30 dB in RF input attenuator
1 Screen message: "Initialising FM noise CAL"
1 #BP 10000

SELECT FILTER UNDER TEST
2 Select A3 demod filter under test
2 Set mod frequency to frequency for filter under test
2 Screen message: "Setting <filter name> filter"
2 #BP 102X0 (where X is filter index for filter under test, see above)

SET NOISE MEASUREMENT RANGE
3 Set FM deviation for range under test
3 Set demod measurement range under test
3 Screen message: "Setting demod range <range name>"
3 #BP 103XY (where X is filter index, Y is range index, see above)

INITIALISE NOISE MEASUREMENT
4 Request demod measurement
4 Screen message: "First reading <filter name> <range name>..."

RECEIVE FM READING
5 READING RETURNED
5 #BP 104XY (where X is filter index, Y is range index, see above)
5 Screen message: "Reading x = xxxx Hz"
5 IF more readings to take
6 Request demod measurement
6 REPEAT from start of section 5
5 ELSE all readings done for current range under test
7 IF more ranges to test for current filter
8 Set range under test = next range

```
8                   #BP 105XY where X is filter index, Y is range index, see above)
8                   REPEAT from section 3
7           ELSE all ranges done for filter under test
9                   IF more filters to test
10                  Set filter under test = next filter
10                  REPEAT from section 2
9                   ELSE all filters done
11                  Calculate residual noise values for each range vs filter
11                  #BP 10600
11                  END
```

Signal generator calibrations

AF5 output level frequency response calibration

Purpose

The purpose of this calibration is to measure the frequency response of the signal generator RF levelling board, AF5.

Description

This calibration works by measuring the signal generator output level with the broad-band power meter.

Calibration points for the frequency response are 10 MHz, 50 MHz, 100 MHz, and so on, to 1150 MHz in 50 MHz steps. The output level of AF5 is set nominally to +7 dBm.

The limit on the errors measured during the calibration is ±4.0 dBm for any point. Any error measured that exceeds this limit will cause the calibration to abort and flag a failure.

Calibration ON/OFF selection key: *[50MHz Steps]*

Calibration procedure

```
            INITIALISATION
1           Switch off all mod sources
1           Select single-port duplex mode on N-type connector
1           Set 0 dB in output attenuators
1           Set AF5 output level +7 dBm
1           Screen message: "Initialised rf level freq response CAL"
1           #BP 10000

            START FREQUENCY RESPONSE MEASUREMENT
2           Set RF generator to test frequency
2           Set receiver frequency to test frequency
2           Set AF5 output level +7 dBm
2           Screen message: "Setting xxx MHz"
2           #BP 20000 + (CAL frequency in MHz)

            START POWER MEASUREMENT
3           Request broad-band power measurement
3           Screen message: "Requested power reading X"

            RECEIVE POWER MEASUREMENT
4           POWER METER READING RETURNED
4           Screen message: "Power reading = xxxx (dBm x 100)"
4           #BP 20001 + (CAL frequency in MHz)
4           IF more readings to be taken
5                   REPEAT from section 3
4           ELSE all readings done
6                   Calculate average power reading & loss
6                   IF error <2 dB
7                           Screen message: "Loss @ xxx MHz = xxxx dB (x100)"
```

7	#BP 20002 + (CAL frequency in MHz)
7	IF all frequency points done
8	Screen message: "Passed AF5 freq response CAL"
8	#BP 20003
8	END
7	ELSE more frequency points to measure
9	Select next CAL frequency
9	REPEAT from section 2
6	ELSE error too large
10	Flag CAL as failed
10	#BP 20004 + (CAL frequency in MHz)
10	END

CAL FAILURE: #BP 20004 + (CAL frequency in MHz)

FM drive gain calibration

Purpose

The purpose of this calibration is to set the gain of the FM source on A1 so that the FM generated on the AE1 1-bit ADC circuit is correct.

Description

This calibration works by using the DCFM capability of the fractional-N chip on AE1. The signal generator and receiver are both tuned to 800 MHz. The FM drive signal from A1 is set to 1.414 V; this corresponds to the peak level of a 1 V RMS sinewave. With DCFM selected on AE1, and a deviation of 100 kHz set on the signal generator fractional-N, the expected result when the FM gain is calibrated is that the carrier should be offset by 100 kHz to 800.1 MHz. The IF counter is used to measure this offset as a successive approximation is performed on the 16-bit number forming the gain scaling for the FM drive on A1.

Calibration ON/OFF selection key: *[FM DAC]*

Calibration procedure

	INITIALISATION
1	Set RF gen and receiver frequency to 800 MHz
1	Set IF bandwidth 3 MHz
1	Set mod freq 0 Hz, level 0 Hz, 0 V DC
1	Select single-port duplex mode on N-type connector
1	Switch RF generator on
1	Switch FM on at tray
1	Set RF generator level –27 dBm at N-type connector
1	Set spectrum analyser reference level +30 dBm, i.e. 0 dB input attenuation
1	Screen message: "Initialised freq factor CAL"
1	#BP 10000
	DO FM NULLING
2	Set fractional-N FM time constant
2	Select ACFM operation on AE1
2	Screen message: "Doing FM nulling"
2	#BP 23000
	INITIALISE FOR FM GAIN
3	Set hardware for 100 kHz deviation at RF tray
3	Select DCFM operation on AE1
3	Switch mod on
3	Set mod freq 0 Hz
3	Set DC level 1.414 V on mod drive from A1
3	Download FM gain values to A1

```
3       Screen message: "Nulling complete, ready"
3       #BP 23001
        SUCCESSIVE APPROXIMATION OVER 16 BITS OF FM GAIN VALUE FOR IF
        OFFSET OF +100 kHz
4       Screen message: "Requesting freq measurement"
4       Request IF offset reading
4       IF OFFSET READING RETURNED
4       #BP 23002
4       IF more bits to test
5               Calculate new gain test value
5               Screen message: "Fm gain or-pattern = xx, loading xx"
5               #BP 23003
5               REPEAT from section 4
4       ELSE successive approximation finished
6               Select ACFM operation at AE1
6               Screen message: "Found FM gain = xxxxx"
6               IF gain value in range 0x1000 to 0xfff0
7                       Cal passed
7                       Screen message: "FM gain figure : xxxx"
7                       #BP 23004
6               ELSE error in gain CAL
8                       Screen message: "FM gain CAL : FAILED!  Using nominal"
8                       #BP 23005
6               END
```

CAL FAILURE: #BP 23005

Bessel zero calibration

Purpose

This calibration is used to provide an absolute FM deviation to allow accurate measurement of FM deviations generated during the FM sensitivity and FM attenuator calibrations, in comparison with the reading for the reference generated by this calibration.

Description

This calibration generates accurately a deviation of 38.64 kHz at a modulation frequency of 7 kHz and carrier frequency of 800 MHz. This is achieved by adjusting the set FM deviation until the carrier spur disappears. This is the second Bessel null (fmod ×5.52) for a modulation frequency of 7 kHz.

The carrier level is measured with the 300 Hz IF filter and the log amp.

Calibration ON/OFF selection key: *[Bessel zero]*

Calibration procedure

```
        INITIALISATION:
1       Set 3 MHz IF filter
1       Set input attenuation 20 dB
1       Select FM input to demod path on A3
1       Set 100 kHz bar chart range
1       Select NO FILTER for demod audio filter
1       Turn off Spectrum Analyzer at tray
1       Set input switch single-port duplex mode on N-type connector
1       Select ACFM in fractional-N
1       Set RF gen frequency 800 MHz
1       Set Tx frequency 800 MHz
1       Set RF generator level –27 dBm at N-type connector
```

```
1       Set mod gen 1 frequency 100 Hz
1       Set mod gen 1 deviation 40 kHz
1       Switch mod gen 1 ON
1       Switch mod gens 2 & 3 OFF
1       Switch on FFT, 50 Hz/div, ref 300 Hz
1       Screen message "Initialised for Bessel zero"
1       #BP 10000

        MEASURE 40 kHz AT 100 Hz:
2       Request peak find on FFT
2       Screen message "Requesting mkr reading for 50 Hz/div @ 100 Hz"
2       5 readings on FFT
2       Screen message "Averaged marker reading = xxxxx"
2       #BP 22000

        FOUND 100 Hz READING:
3       Save reading as 100 Hz reference
3       Set mod 1 frequency 7 kHz
3       Set vco sensitivity DAC = 0x80
3       Centre frequency 7.2 kHz for FFT
3       Screen message "Dev @ 100Hz mod freq = xxxx Hz"
3       #BP 22001

        TRIGGER 7 kHz CAL:
4       Request peak find on FFT
4       Screen message "Req wideband reading @ 7 kHz mod freq"
4       5 readings on FFT
4       Screen message "Averaged marker reading = xxxxx"
4       #BP 22002

        SUCCESSIVE APPROXIMATION:
5       Test reading against 100 Hz reference reading
5       IF successive approximation finished
5               Load check value into sensitivity DAC
5               Screen message "800 MHz, read xxxxx, loading check xx"
5               #BP 22003
5               GOTO section 6
5       ELSE
5               Calculate and load new sensitivity DAC value for approximation
5               Screen message "800 MHz, read xxxxx, loading xx"
5               #BP 22004
5               REPEAT from section 4

        TRIGGER 7 kHz CHECK:
6       Request peak find on FFT
6       Screen message "Req wideband check reading @ 800 MHz"
6       5 readings on FFT
6       Screen message "Averaged marker reading = xxxxx"
6       #BP 22005

        READ 7 kHz CHECK LEVEL
7       Select final sensitivity DAC setting for 40 kHz deviation @ 800 MHz
7       Screen message "800 MHz sensitivity value = xxx"
7       #BP 22006

        INITIALIZE FOR ZERO:
8       Select 300 Hz IF filter
8       Select input attenuation 30dB
8       Set RF gen frequency 800 MHz
8       Set mod 1 frequency 7 kHz
8       Set nominal mod 1 deviation 40.001 kHz
8       #BP 22007
```

```
        INITIALIZE ZERO SEARCH:
9       Request narrow-band power measurement of carrier level
9       Screen message "Requested log amp reading"
9       #BP 22008
10      GOT BESSEL ADC READING:
11              5 readings, screen message "xxxxx, Carrier level 1/2/3/4/5 = xxxx"
11              #BP 22009
10      Calculate average reading
10      Screen message "Reading @ (deviation) = (carrier level), going UP/DOWN"
10      Check for carrier null found
10      IF carrier null has not been found
12              Adjust deviation
12              GOTO section 9
12              #BP 22010
10      ELSE
13              Set IF filter 3 MHz
13              Set input attenuator 20 dB
13              Switch on FFT
13              Select FM input to A3 demod path
13              Set 100 kHz bar chart gain ranging
13              Select demod audio filter = NO FILTER
13              #BP 22011
        FOUND ZERO:
14      Screen message "ZERO @ setting (deviation)Hz, error = x.x%"
14      Set FFT span = 500 Hz/div
14      Set FFT ref frequency 6 kHz
14      #BP 22012
        READ SENSITIVITY REFERENCE:
15      Request FFT marker reading, averaged over 6 readings
15      Screen message "Requesting marker reading for 2.5 kHz/div"
15      6 readings on FFT
15      Screen message "Averaged marker reading = xxxxx"
15      #BP 22013
        FOUND SENSITIVITY REFERENCE:
16      Screen message "Found reference for sens CAL = (marker reading)"
16      #BP 22014
        SET FOR ATTEN REFERENCE:
17      Set FFT span = 50 Hz/div
17      Set FFT ref frequency 7.2 kHz
17      Screen message "Setting up FFT to read @ 7 kHz"
17      #BP 22015
        READ_ATTEN_REF_10kHz:
18      Request peak find on FFT
18      Screen message "Requesting mkr reading for 50 Hz/div @ 7 kHz"
18      5 readings on FFT
18      Screen message "Averaged marker reading = xxxxx"
18      #BP 22016
        SET UP ATTEN REFERENCE AT 100 Hz:
19      Screen message "7 kHz reading = (marker reading)"
19      Set mod 1 frequency 1 kHz
19      Set mod 1 deviation 38.64 kHz
19      Set FFT span = 50 Hz/div
19      Set FFT ref frequency 300 Hz
19      #BP 22017
```

```
        READ ATTEN REFERENCE AT 100 HZ:
20      Request peak find on FFT
20      Screen message "Requesting mkr reading for 50 Hz/div @ 100 Hz"
20      5 readings on FFT
20      Screen message "Averaged marker reading = xxxxx"
20      #BP 22018

        FOUND ATTEN REFERENCE:
21      Screen message "Found attenuator CAL correction = xx"
21      #BP 22019
END
```

CAL FAILURE: #BP 20020

FM sensitivity calibration

Purpose

This calibration is used to determine the required settings of the VCO sensitivity compensation DAC on AF2, accross the range of frequencies of the three signal generator oscillators.

Description

This calibration works by performing successive approximations on the load value of the sensitivity compensation DAC to get FM demod FFT readings the same as a reference reading. The reference reading is obtained either by:-

1. Setting up the test deviation at 100 Hz and relying on the accuracy of low frequency FM generation in the fractional-N and 1-bit ADC on AE1, and measuring the demod on the FFT.

or

2. Using the FFT reference reading found during the Bessel Zero calibration.

The CAL points are at 4 MHz intervals on the fundamental ranges of each oscillator (576 to 1155 MHz), but the calibration is performed over the range 288 to 576 MHz in 2 MHz steps.

The frequency ranges for each oscillator are as follows:-

OSCILLATOR 0	288 - 360 MHz inclusive
OSCILLATOR 1	360 - 456 MHz inclusive
OSCILLATOR 2	456 - 576 MHz inclusive

Note that some displayed frequencies and break values will be duplicated, i.e. 360 and 456 MHz. However, for the final test point for each oscillator, the actual test frequencies are 100 Hz lower. This is done to ensure that the RF tray keeps the required oscillator selected.

For example, the last test frequency for oscillator 0 is 359.999900 MHz, but the display will show 360 MHz, and the CAL break point values for that test point will include the digits 360, as will the display and break values for the first test point on oscillator 1 (which is at exactly 360 MHz).

Calibration ON/OFF selection key: *[FM DAC]*

Calibration procedure

```
        INITIALISATION
1       Set FFT for FM calibration
1       Select single-port duplex mode on N-type connector
1       Set fractional-N time constant to 31.25 ms
1       Switch RF generator ON
1       Set RF generator level –27 dBm at N-type connector
1       Set output attenuator to 20 dB
1       Select 3 MHz IF filter
1       Select A3 FM demod input as input to A3 demod filter path
1       Set 100 kHz FM bar chart range on A3
```

1 Select demod audio filter = NO FILTER
1 Set mod freq 100 Hz
1 Set hardware for FM deviation = 38.64 kHz
1 Screen message: "Initialised FM sensitivity"
1 #BP 10000

START FM SENSITIVITY
2 Set RF gen freq for test point
2 Set receiver frequency for test point
2 Set mod gen frequency 100 Hz
2 Screen message: "Setting xxx MHz"
2 #BP 24000

START 1-BIT ADC READING
3 Set FFT reference frequency 500 Hz, span 100 Hz/div
3 Request FFT marker peak find and marker reading
3 Screen message: "Req mod reading, T.E., freq = xxx MHz"
3 #BP 24001
3 MARKER LEVEL READING RETURNED = 1-bit ADC reference reading
3 Set mod gen frequency 7 kHz
3 Set FFT reference frequency 6 kHz, span 500 Hz/div
3 Screen message: "Dev @ 100Hz mod freq = xxxxx Hz"
3 IF BESSEL ZERO calibration done
4 Screen message: "Using Bessel reference"
4 1-bit ADC reference reading = Bessel zero reference reading
3 #BP 24002

SET FOR WIDEBAND MEASUREMENTS
5 Set RF gen and receiver frequency to test point frequency

5 SUCCESSIVE APPROXIMATION OVER 8 BITS ON VCO SENSITIVITY DAC
6 Write test load value to DAC
6 #BP 24XXX (where XXX is the test frequency in MHz)
6 Request FFT marker peak find and marker reading
6 Screen message: "Req wideband reading @ xxx MHz"
6 MARKER LEVEL READING RETURNED
6 #BP 25XXX (where XXX is the test frequency in MHz)
6 Test reading to see if bit needed in load value
6 Screen message: "xxx MHz, read xxxxx, loading xx"
6 IF more bits to check in approximation
7 REPEAT from section 6
6 ELSE all bits done
8 IF DAC load value = 0 or 255
9 Flag CAL as failed
9 Screen message: "Failed sensitivity CAL at xxx MHz"
9 #BP 24001 + (CAL frequency in MHz)
8 ELSE sensible DAC value found
10 Load DAC with (DAC value + 1)
10 Screen message: "%ld MHz, read %ld, loading check %d"
10 #BP 27XXX (where XXX is the test frequency in MHz)

WIDEBAND GAIN CHECK
11 Request FFT marker peak find and marker reading
11 Screen message: "Req wide-band check reading @ xxx MHz"
11 MARKER LEVEL READING RETURNED
11 #BP 28XXX (where XXX is the test frequency in MHz)
11 Select final DAC load value
11 Store DAC load value for test point freq
11 Screen message: "Osc x, freq xxx, index xx, value xx"
11 Increment test frequency by 2 MHz
11 IF all test frequencies calibrated

12 #BP 24004
12 END
11 ELSE more frequencies to calibrate
13 #BP 29XXX (where XXX is the test frequency in MHz)
13 REPEAT from section 5

CAL FAILURE: #BP 24001 + (CAL frequency in MHz)

FM attenuator calibration

Purpose

The purpose of this calibration is to compensate for errors in the setting of the FM attenuator DAC on AF2 by adjusting the setting of the sensitivity compensation DAC (as found in the FM sensitivity calibration).

Description

For each of the attenuator settings, there may be a slight error in the setting of the DAC or block attenuator. This calibration works by using the Bessel zero reference reading to calculate the error in the 1-bit ADC FM generation and FFT readings. FM deviations are set up and measured at 100 Hz; then at 7 kHz, and the sensitivity DAC setting is successively approximated for the same deviation reading, subject to corrections found in the Bessel zero / 1-bit ADC comparison found at the start of this calibration. From these settings of the sensitivity DAC, incremental correction values are obtained with which the nominal sensitivity DAC settings (found in the FM sensitivity calibration) may be adjusted to cancel errors in the setting of the FM attenuators.

The ranges for the FM attenuator settings are shown in the table below. The attenuation range selected for a particular deviation required will be as shown for RF generator frequencies of 576 MHz and above.

Due to the limitation of 100 kHz on the deviation measurement, the higher ranges are tested by setting one half, one quarter, or one eighth of the required deviation at one half, one quarter, or one eighth of the RF generator test frequency of 800 MHz. For example, the maximum deviation range is tested by setting 100 kHz deviation at 100 MHz carrier frequency (this corresponds to 800 kHz deviation at 800 MHz at the oscillator on AF2).

Further, the calibration is conducted only for range 17 and above because of the difficulty of accurately measuring low deviations.

Range	Lower dev	Upper dev	Total RF tray atten (dB)
0		< 14 Hz	96
1	14 Hz	19 Hz	93
2	20 Hz	27 Hz	90
3	28 Hz	39 Hz	87
4	40 Hz	55 Hz	84
5	56 Hz	79 Hz	81
6	80 Hz	112 Hz	78
7	113 Hz	159 Hz	75
8	160 Hz	225 Hz	72
9	226 Hz	319 Hz	69
10	320 Hz	451 Hz	66
11	452 Hz	638 Hz	63
12	639 Hz	903 Hz	60

(Continued)

Range	Lower dev	Upper dev	Total RF tray atten (dB)
13	904 Hz	1.277 kHz	57
14	1.278 kHz	1.807 kHz	54
15	1.808 kHz	2.555 kHz	51
16	2.556 kHz	3.614 kHz	48
17	3.615 kHz	5.112 kHz	45
18	5.113 kHz	7.229 kHz	42
19	7.230 kHz	10.254 kHz	39
20	10.255 kHz	14.460 kHz	36
21	14.461 kHz	20.450 kHz	33
22	20.451 kHz	28.921 kHz	30
23	28.922 kHz	40.900 kHz	27
24	40.901 kHz	57.843 kHz	24
25	57.844 kHz	81.802 kHz	21
26	81.803 kHz	115.687 kHz	18
27	115.688 kHz	163.606 kHz	15
28	163.607 kHz	231.374 kHz	12
29	231.375 kHz	327.213 kHz	9
30	327.214 kHz	462.749 kHz	6
31	462.750 kHz	654.426 kHz	3
32	654.427 kHz	925.500 kHz	0

The following table shows, for each FM attenuator range (from 17 to 32), the CAL setup used to calibrate the FM attenuator errors - RF generator frequency and receiver frequency, test deviation used, equivalent scope vertical range used to set the FFT range and the FM attenuator range.

Index	RF gen freq	Test dev (kHz)	FFT scale (per/div)
17	800 MHz	5	20kHz
18	800 MHz	7	20kHz
19	800 MHz	10	20kHz
20	800 MHz	14	20kHz
21	800 MHz	20	50kHz
22	800 MHz	28	50kHz
23	800 MHz	40	50kHz
24	800 MHz	50	50kHz
25	800 MHz	80	100kHz
26	800 MHz	100	100kHz
27	400 MHz	80	100kHz
28	400 MHz	100	100kHz
29	200 MHz	80	100kHz
30	200 MHz	100	100kHz
31	100 MHz	80	100kHz
32	100 MHz	100	100kHz

Calibration ON/OFF selection key: *[FM Atten]*

Calibration procedure

INITIALISATION
1 Select single-port duplex mode on N-type connector
1 Select fractional-N FM time constant 31.25 ms
1 Set RF generator level –27 dBm at N-type connector
1 Select 3 MHz IF filter bandwidth
1 Set input attenuator 20 dB
1 Reset A1 sine generators
1 Select A3 demod bar chart 100 kHz range
1 Route A3 FM demod input to A3 demod filter path
1 Select A3 demod filter NO FILTER
1 Screen message: "Initialised FM attenuator CAL"
1 #BP 10000

INITIALISE FOR 1-BIT ADC READING
2 Set RF gen and receiver frequency to test point frequency
2 Set mod gen 1 frequency 100 Hz
2 Set mod level for test point
2 Screen message: "Setting 100 Hz mod freq, range xx"
2 Set FFT for FM CAL
2 Set FFT reference frequency 300 Hz, span 50 Hz/div
2 #BP 300XX (where XX is the range under test - see description above)

START 1-BIT ADC READING
3 Request peak find and marker level on FFT
3 Screen message: "Req mod reading, T.E., freq = xxx MHz"
3 MARKER LEVEL READING RETURNED
3 #BP 301XX (where XX is the range under test)
3 Save reading as 1-bit ADC reference reading
3 Set mod gen 1 frequency 7 kHz
3 Screen message: "Dev @ 100Hz mod freq = xxxxx Hz"
3 Set FFT reference frequency 7.2 kHz, span 50 Hz/div
3 #BP 302XX (where XX is the range under test)

SUCCESSIVE APPROXIMATION OVER 8 BITS ON VCO SENSITIVITY DAC FOR FM
DEVIATION = 1-BIT ADC REFERENCE
4 Load test value to VCO sensitivity DAC
4 Request peak find and marker level on FFT
4 Screen message: "Req wideband reading @ 7 kHz mod freq"
4 MARKER LEVEL READING RETURNED
4 #BP 303XX (where XX is the range under test)
4 Test reading to see if bit needed in load value
4 Screen message: "xxx MHz, read xxxxx, loading xx"
4 IF more bits to check in approximation
5 REPEAT from section 4
5 #BP 304XX (where XX is the range under test)
4 ELSE all bits done
6 IF DAC load value = 0 or 255
7 Flag CAL as failed
7 Screen message: "Failed attenuators CAL on range xx"
7 #BP 308XX (where XX is the range under test)
6 ELSE sensible DAC value found
8 Load DAC with (DAC value + 1)
8 Screen message: "xxx MHz, read xxx, loading check xxx"
8 #BP 305XX (where XX is the range under test)

WIDEBAND GAIN CHECK

9 Request FFT marker peak find and marker reading
9 Screen message: "Req wideband check reading @ xxx MHz"
9 MARKER LEVEL READING RETURNED
9 #BP 306XX (where XX is the range under test)
9 Select final DAC load value
9 Store DAC load value for test point
9 Screen message: "Nominal = xx, corrected = xx, corr = x.xxx"
9 IF all test points calibrated
10 #BP 30002
10 END
9 ELSE more test points to calibrate
11 #BP 307XX (where XX is the range under test)
11 REPEAT from section 2

CAL FAILURE: #BP 308XX (where XX is the range under test)

Receiver calibrations

IF chain frequency response calibration

Purpose

This calibration determines the frequency response of the IF chain in the RF tray to allow correction of frequency dependent level errors in log amp readings and spectrum analyser levels.

Description

The frequency response of the IF chain is measured at CAL points from 10 MHz, 50 MHz and up in 50 MHz steps to 1000 MHz. Two passes are made to perform the measurements for the sensitive receiver 20 dB amplifier being switch on and off. Level measurements are made by routeing the signal generator to the receiver and measuring the level in the log amp.

Calibration procedure

Note: In break-point values, X represents 0 when the normal mode (i.e. 20 dB amplifier bypassed) is under test; X represents 2 when the 20 dB amplifier path is selected for test.

INITIALISATION

1 Set input switch to single-port duplex mode on N-type connector
1 Set RF generator frequency 10 MHz
1 Set RF gen level +4 dBm at AF5 output
1 Set output attenuator to 0 dBm
1 Switch RF gen on
1 Select 3 MHz IF filter
1 Set Tx frequency to 10 MHz
1 Switch all mod sources off
1 Select 3 kHz video filter
1 Screen message: "Initialised i.f. chain response"
1 #BP 10000

INITIALISE FOR BYPASS PATH

2 Set input attenuation 40 dB
2 Bypass sensitive receiver amplifier
2 Screen message: "20 dB amplifier bypassed, 40dB input att"
2 #BP 40000
2 GOTO SECTION 4

```
        INITIALISE SENSITIVE RECEIVER PATH
3       Set input attenuation 60 dB
3       Select sensitive receiver amplifier
3       Screen message: "20 dB amplifier selected, 60dB input att"
3       #BP 42000
3       GO TO SECTION 6

        MEASURE 10 MHz REFERENCE
4       Set Tx and Rx freq to 10 MHz
4       RF Gen AF5 output level to +4 dBm
4       Screen message: "Initialised for 10 MHz reference reading"
4       #BP 40001

        GET 10 MHz REFERENCE READING
5       Request log amp ADC reading
5       ADC READING RETURNED FROM A5
5       #BP 40002
5       Screen message: "10 MHz reference reading = xxxx"
5       #BP 40003

        CALIBRATE IF PATH
6       Set test frequency (starts at 10 MHz) on generator and receiver
6       Set RF gen level +4 dBm at AF5 output, corrected for AA1 path loss
6       Screen message: "Setting up xxx MHz"
6       #BP 4X004 + test frequency in MHz

        GET ADC READING
7       Request log amp ADC reading
7       ADC READING RETURNED FROM A5
7       #BP 4X005 + test frequency in MHz
7       Calculate IF level error
7       Screen message: "[freq in MHz], reading = xxxx, loss = xx (dBmx100)"
7       Store correction value
7       #BP 4X006 + test frequency in MHz
7       REPEAT from section 6 until test frequency = 1000 MHz
7       IF bypass path selected
8               GOTO SECTION 3
7       ELSE
9               #BP 40007
9               END
```

Crystal filter automatic calibration

Purpose

The purpose of this calibration is to provide automatic calibration of the spectrum analyser crystal filters for centre frequency and gain settings.

Description

This calibration determines load values for the centre frequency DAC settings of the 300 Hz and 1 kHz crystal filters, and null strays DAC settings for the 3 kHz, 10 kHz and 30 kHz crystal filters, such that all the filters are tuned to 10.7 MHz within the following limits:-

Filter Nbr	Filter	Centre freq limit (Hz)
0	300 Hz	>10
1	1 kHz	>30
2	3 kHz	>100
3	10 kHz	>300
4	30 kHz	>1000

The gain DAC settings are also determined such that the filter gain is set to ±5 dB of the correct level (gains are accurately set by the crystal filter fine levelling calibration).

Calibration ON/OFF selection key: *[RX GAIN]*

Calibration procedure

	INITIALISATION
1	Filter under test = 300 Hz
1	Select single-port duplex mode on N-type connector
1	Switch off all mod sources
1	Set receiver frequency to 10 MHz
1	Set RF gen frequency to 10 MHz
1	Set spectrum analyzer reference level +40 dBm
1	Set signal generator level to –30 dBm at N-type connector
1	Select power range 2 on broad-band power meter (measures –18 dBm to –3 dBm)
1	#BP 10000
	START CRYSTAL REFERENCE
2	Request broad-band power measurement
2	Screen message: "Requested power reading 0"
	READ CRYSTAL REFERENCE
3	POWER READING RETURNED
3	#BP 44000
3	IF more readings to take
4	Request broad-band power measurement
4	Screen message: "Requested power reading x"
4	REPEAT from start of section 3
3	ELSE all readings done
5	Calculate average power reading
5	Screen message: "Found crystal reference = xxxx"
5	Target level for filter peaking = power reading
5	#BP 44001
	INITIALISE FOR CRYSTAL AUTOCAL
6	Set spectrum analyzer reference level 0 dBm
6	Set signal generator level to –70 dBm at N-type output
	CRYSTAL FILTER READY
7	Set for expanded size spectrum analyser
7	Set spectrum analyzer reference frequency 10 MHz
7	Set spectrum analyzer span for filter under test
7	Set for repetitive sweep
7	Switch markers on
7	Select crystal filter under test
7	Screen message: "Initialised for <filter> filter autocal"
7	#BP 44X02 where X is filter number (see table above)
	REQUEST CENTRE FREQUENCY CHECK
8	FIND CRYSTAL FILTER CENTRE FREQUENCY
8	#BP 44X03 where X is filter number (see table above)
	FOUND CENTRE FREQUENCY
9	Screen mesage: "Centre freq= xxxxxxxxHz, error = xxxHz"
9	IF filter under test >= 3kHz
10	MEASURE LEVEL AT REFERENCE FREQUENCY
10	#BP 44X04 where X is filter number (see table above)
10	GOTO SECTION 14
9	ELSE filter under test is 300 Hz or 1 kHz
11	IF filter level outside ±5 dB of target level

```
                ADJUST PEAK LEVEL
12              #BP 44X05 where X is filter number (see table above)
12              REPEAT from start of section 9
11              ELSE filter level OK
13              GO TO SECTION 17

        CHECK LEVEL AT REFERENCE FREQUENCY
14      IF filter level outside 5 dB of target level
15              ADJUST LEVEL AT REFERENCE FREQUENCY
15              #BP 44X06 where X is filter number (see table above)
14      ELSE filter level OK at reference frequency
16              Screen message: "<filter> level ok, recheck centre freq"
16              #BP 44X07 where X is filter number (see table above)

17      CHECK CENTRE FREQUENCY
17      IF centre frequency outside limits
                ADJUST CENTRE FREQUENCY
18              #BP 44X08 where X is filter number (see table above)
17      ELSE centre frequency in limits
19              IF filter under test >= 3 kHz
20              ADJUST LEVEL AT REFERENCE FREQUENCY
20              #BP 44X09 where X is filter number (see table above)
19              ELSE on 300 Hz or 1 kHz filter
21              ADJUST PEAK LEVEL
21              #BP 44X09 where X is filter number (see table above)

        CENTRE FREQUENCY LEVEL IN LIMITS
22      Screen message: "<filter> filter done"
22      IF more filters to adjust
23              Choose next filter under test
23              REPEAT from section 7
22      ELSE all filters done
24              Switch off spectrum analyser
24              Calculate target level for ceramic filter gain and crystal
                filter level fine-tune calibrations.
24              #BP 44010
24              END

CAL FAILURE: #BP
```

Ceramic filter loss calibration

Purpose

The purpose of this calibration is to provide offsets which can be applied to log amp readings to compensate for gain errors in the 110 kHz, 280 kHz and 3 MHz ceramic IF filters.

Description

This calibration relies on the set-up and target level used in the crystal filter automatic calibration. The level of the IF is measured for each of the filters and the difference between these readings and the target level (found using the broad-band power meter in the crystal filter autocal) give offsets which must be applied to log amp readings to correct for gain errors in these filters.

Calibration procedure

```
        INITIALISATION
1       Select 3 MHz IF filter
1       Select 3 kHz video filter
1       Screen message: "Initialised ceramic filter CAL"
1       #BP 10000

        READ IF LEVEL IN 3 MHz FILTER
2       Take 5 ADC readings
3               Screen message: "3MHz CAL, level x = xxxx"
3               #BP 45000
2       Average readings
2       Calculate loss in 3 MHz filter
2       Screen message: "3MHz CAL done, loss = xxxx"
2       Select 280 kHz IF filter
2       IF loss within ±10 dB
3               Update loss figure
3               #BP 45001
2       ELSE
4               Screen message: "3MHz loss out of range"
4               #BP 45100

        READ IF LEVEL IN 280 kHz FILTER
5       Take 5 ADC readings
6               Screen message: "280kHz CAL, level x = xxxx"
6               #BP 45002
5       Average readings
5       Calculate loss in 3 MHz filter
5       Screen message: "280kHz CAL done, loss = xxxx"
5       Select 110 kHz IF filter
5       IF loss within ±10 dB
6               Update loss figure
6               #BP 45003
5       ELSE
7               Screen message: "280kHz loss out of range"
7               #BP 45200

        READ IF LEVEL IN 280 kHz FILTER
8       Take 5 ADC readings
7               Screen message: "110kHz CAL, level x = xxxx"
7               #BP 45004
8       Average readings
8       Calculate loss in 110 kHz filter
8       Screen message: "110kHz CAL done, loss = xxxx"
8       IF loss within ±10 dB
9               Update loss figure
9               #BP 45005
8       ELSE
10              Screen message: "110kHz loss out of range"
10              #BP 45300
8       END
```

CAL FAILURE: #BP 45100, #BP 45200, #BP 45300

Crystal filter gain calibration

Purpose

The purpose of this calibration is to determine the settings for the crystal filter gain DAC on AE6 for each of the crystal filters, such that the level input to the log amp via any of these filters gives a power reading the same as that obtained using the broad-band power meter.

Description

This calibration relies on the set-up and target level used in the crystal filter automatic calibration. The gain DAC setting for each crystal filter is determined by a successive approximation to the target level (found in crystal filter autocal) measured in the log amp. Due to the fact that the filters are adjusted in static conditions, this calibration provides more accurate adjustment than the automatic filter calibration during which the sweeping of the filter causes level errors.

Filter Nbr	Filter
0	300 Hz
1	1 kHz
2	3 kHz
3	10 kHz
4	30 kHz

Filter number is represented by 'X' in the calibration break-point values.

Calibration procedure

INITIALISATION
1 Filter under test = 300 Hz
1 Screen message: "Initialised crystal filter gain CAL"
1 #BP 10000

START CRYSTAL FILTER GAIN CAL
2 Screen message: "Calibrating <filter name> crystal filter gain"
2 #BP 46X00 (see description, above)
2 SUCCESSIVE APPROXIMATION OVER 12 BITS OF CRYSTAL FILTER GAIN DAC FOR FILTER LEVEL = TARGET LEVEL FROM CRYSTAL FILTER AUTOCAL
3 Set crystal filter gain DAC with test value
3 Set filter under test
3 Screen message: "Set up <filter name> crystal filter"
3 #BP 46X01
3 Request narrow-band power reading
3 Screen message: "Requested ADC reading <filter name> crystal filter"
3 IF LEVEL READING RETURNED
3 #BP 46X02
3 Test level for bit set in DAC value
3 IF more bits to test in gain DAC value
4 Set new bit to test in DAC value
4 Screen message: "<filter name>, ADC=%ld, new load value = xx"
4 #BP 46X03
4 REPEAT from start of section 3
3 ELSE all bits tested
5 Screen message: "<filter name>, final load value = xx"
5 IF more filters to calibrate
6 #BP 46X04
6 IF filter load value = 0 or 4095
7 Flag CAL as failed
7 Screen message: "Failed succ approx on XTAL filter"

7	#BP 46X06
7	END
6	REPEAT from section 2 for next filter
5	ELSE CAL finished
8	Download gain settings to AE1
8	#BP 46005
8	END

CAL FAILURE: #BP 46006, #BP46106, #BP46206, #BP46306, #B46406

External modulation calibrations

External modulation offset calibration

Purpose

This calibration is used to determine the setting of the offset DAC for the external modulation path input on A3.

Description

The load value required for the external mod input offset DAC on A3 is found by grounding the input to the external mod path and routeing the output of the path to the ADC on A2. A successive approximation is performed on the 12-bit load value for the DAC until the ADC reading indicates
0 V.

Calibration procedure

	INITIALISATION
1	Route external mod path to RMS-DC/DC filter inputs on A2
1	Select DC filter input to ADC
1	Route GROUND to CAL signal
1	Select GROUND for AFREF signal
1	Set external modulation gain range for 1 V RMS input
1	Set external modulation path input offset DAC to mid-point (2048)
1	Select non-inverted external mod (inverted at A2 output)
1	#BP 1000
	SUCCESSIVE APPROXIMATION FOR EXTERNAL MOD INPUT OFFSET DAC
2	Load DAC with test value
2	Screen message: "Set ext mod input offset DAC = xxxx"
2	#BP 19000
	READ EXTERNAL MOD INPUT OFFSET
3	Request ADC readings (8 off)
4	ADC READING RETURNED
4	#BP 19001
3	Screen message: "Measure EM input offset for DAC value xxxx"
3	Offset reading found
3	#BP 19002
3	Screen message: "EM input offset xxxx for DAC value xxxx = xxxx"
	CALC EM INPUT OFFSET
2	Average readings to calculate offset
2	Screen message: "Found EM offset = xxxx for DAC value xxxx"
2	#BP 19003
2	REPEAT section 2 in successive approx of DAC value for offset = 0

SUCCESSIVE APPROXIMATION FINISHED
4 IF offset DAC setting = 0 or 4095
4 Screen message: "EM input offset failed"
4 #BP 19004
4 ELSE
4 Store DAC value in RAM
4 Set offset DAC with new offset value
4 Screen message: "Found EM input offset DAC value = xxxx"
4 #BP 19005
4 END

External modulation FM gain calibration

Purpose

This calibration is used to set the gain value used on A1 for scaling the external mod input signal for FM.

Description

This calibration uses the DCFM capability of the fractional-N chip on AE1. After performing an "FM nulling" to remove effects of DC offsets in the AE1 1-bit ADC (digital FM loop), the hardware is set for a deviation of 100 kHz. The mod drive is set to 1.414 V DC and DC-coupled FM is selected on AE1. The result of this is that the signal generator frequency is offset by some amount. The value of the A1 external mod gain figure is changed by a successive approximation until the offset is exactly 100 kHz, at which point the external mod scaling is calibrated for FM.

Calibration procedure

INITIALISATION
1 Set RF gen freq 800 MHz
1 Set Tx freq 800 MHz
1 Select 3 MHz IF filter
1 Switch off all mod sources
1 Select CAL signal GROUND
1 Set external mod input offset to value found by offset CAL
1 Set external mod range on A3 for 1 V RMS
1 Select A2/A3 CAL signal as input to external mod path on A3
1 Set external mod input scaling to 90% on A1
1 Set external mod FM scaling on A1 to maximum
1 Route external mod input to FM summer on A1
1 Select single-port duplex mode on N-type connector
1 Switch RF gen on
1 Switch mod source (grounded) ON
1 Set RF gen level –27 dBm
1 Select 3 MHz spectrum analyser filter, 30 dB input attenuation
1 Screen message: "Initalised ext mod FM gain CAL"
1 #BP 10000

DO EXTERNAL MOD FM NULLING
2 Set fractional-N FM time constant to 4 seconds
2 Select AC-coupled FM on signal generator fractional-N
2 Screen message: "Doing FM nulling"
2 #BP 19006

NULLING COUNTDOWN
3 Countdown in seconds, Screen message: "24", "23", "22", etc.
3 #BP 19007

```
        INITIALISE FOR EM FM GAIN CAL
4       Set 1.414 V DC on A1 AFREF signal
4       Select 1 V DC on A2/A3 CAL signal
4       Set FM deviation 100 kHz
4       Select DC-coupled FM at signal generator fractional-N
4       Set external mod FM gain to 32768 (half full scale)
4       Switch FM mod ON
4       Screen message: "Nulling complete, ready"
4       #BP 19008
5       SUCCESSIVE APPROXIMATION ON EXTERNAL MOD FM GAIN
        FOR EACH OF 16 BITS IN GAIN VALUE:
6               Request IF count
6               Screen message: "Requesting freq measurement"
6               IF count returned
6               Screen message: "Received IF offset = xxxxx Hz"
6               #BP 19009
6               Load new external mod FM gain
6               Screen message: "EM FM gain or-pattern=xxxx, loading xxxx"
6               REPEAT section 6
5       WHEN APPROXIMATION FINISHED:
5       IF CAL successful
7               Screen message: "Found scaling factor = xxxx"
7               #BP 19011
5       ELSE (CAL failed)
8               Screen message: "Scaling factor = xxxx, FAILED!"
8               #BP 19012
5       END
CAL FAILURE: #BP 19012
```

External modulation AM gain calibration

Purpose

This calibration is used to set the gain value used on A1 for scaling the external mod input signal for AM.

Description

When carrier is amplitude modulated at 63.2% by a 1 kHz mod signal, the sidebands are separated from the carrier by 1 kHz, and are 10 dB down on the carrier level. This calibration uses such a set-up to measure the error in the carrier-to-sideband difference, using the log amp with a 300 Hz IF filter. From this error, the external mod scaling figure on A1 for AM can be adjusted to correct gain errors. To ensure the log amp readings are not affected by non-linearity in the log amp when measuring the sideband level, the signal generator output attenuation is reduced by 10 dB to bring the sideband up to the point on the log amp where the carrier level was measured. Further, the change in attenuation is measured accurately by the use of the broad-band power meter.

Calibration procedure

```
        INITIALISE ATTENUATOR STEP MEASUREMENT
1       Set input switch to route sig gen output to broad-band power meter
1       Switch OFF all internal mod sources
1       Set RF generator output frequency 36 MHz
1       Set receiver frequency 36 MHz
1       Set 5 dBm at AF5 output
1       Set output attenuators to 0 dB      /* Should read –4.5 dBm at the   */
1       #BP 10000
```

```
        MEASURE SIG GEN OUTPUT LEVEL FOR CARRIER REFERENCE
2       Request power meter reading
3               Screen message: "Requested power reading X"
3               POWER READING RETURNED
3               Screen message: "Power reading = xxx (dBm x 100)"
3               #BP 19020
3               IF reading out of range
4                       Screen message: "Cal failed, check power meter CAL"
4                       #BP 19021
4                       END
3               ELSE REPEAT section 3 until all readings done
2       Calculate average reading
2       Screen message: "Found reading, atten out, = xxx dBm*100"
2       Set RF output attenuation 10 dB
2       #BP 19022

        MEASURE ATTENUATOR STEP
5       Request power meter reading
6               Screen message: "Requested power reading X"
6               POWER READING RETURNED
6               Screen message: "Power reading = xxx (dBm x 100)"
6               #BP 19023
6               IF reading out of range
7                       Screen message: "Cal failed, check power meter CAL"
7                       #BP 19024
7                       END
6               ELSE REPEAT section 5 until all readings done
5       Calculate average reading, calculate 10 dB step size
5       Screen message: "Found attenuator step = xxx dBm*100"
5       #BP 19025

        INITIALISE EXTERNAL MOD AM GAIN CAL
8       Set RF input to single-port duplex mode on N-type connector
8       Set +7 dBm at AF5 output
8       Set input attenuation to 40 dB
8       Select sensitive receiver OFF (20 dB amplifier bypassed)
8       Select 300 Hz crystal IF filter
8       On A1 connect Vref/2 to AFREF signal
8       Route external mod input on A1 to A1 AM output
8       Screen message: "Initialised ext AM gain CAL"
8       #BP 19026

        MEASURE AM CARRIER LEVEL
9       Set receiver frequency 36 MHz
9       Set 10 dB in RF output attenuator
9       Set external mod input offset DAC
9       Rout A2/A3 CAL signal into A3 external mod input
9       Select 40 dB attenuation in A3 external mod input path
9       Set inverted  external mod on A2
9       Set 1V RMS, 1 kHz on A1 audio generator and route to AFREF
9       Select AFREF as A2/A3 CAL signal
9       Screen message: "Initialised for carrier read"
9       #BP 19027
9       Request log amp ADC reading
9       Screen message: "Requesting first carrier read"

10      READING RETURNED
10      #BP 19028
10      Screen message: "Ext AM gain carrier level X = XXXX dBm (x100)"
```

10 Request log amp ADC reading
10 REPEAT section 10 until 8 readings have been taken

CALCULATE AVERAGED CARRIER LEVEL
11 Calculate averaged carrier level reading
11 Screen message: "Starting sideband measurement"
11 Set Tx freq 35.999 MHz
11 Set RF output attenuation to 0 dB
11 #BP 19029

MEASURE AM SIDEBAND LEVEL
12 Request log amp ADC reading
12 Screen message: "Requesting sideband read"

13 READING RETURNED
13 #BP 19030
13 Screen message: "Ext AM gain SB level X = XXXX dBm (x100)"
13 Request log amp ADC reading
13 REPEAT section 13 until 8 readings have been taken

CALCULATE AVERAGED SIDEBAND LEVEL
14 Calculate averaged sideband level reading
14 Calculate AM gain error & A1 gain value
14 Screen message: "Ext AM gain CAL value = %x, finished"
14 #BP 19031
14 END

CAL FAILURE: #BP 19021, #BP 19024

FFT calibrations

FFT DC marker nulling

Purpose

This calibration is used to enable the A5 2105 DSP to offset its DAC readings to compensate for DC offsets on the input path on A5.

Description

This calibration works by grounding the CAL signal line on A2/A3, and routeing it to A5 from A2. Using the FFT display, the level of the DC marker is reduced to a minimum by varying the offset value which the DSP on A5 applies to its DAC readings. This offset value is important for reducing the size of the DC marker on the FFT displays, so that low signal levels can be found with the peak find facility. It is also essential for DTMF decoding to operate reliably.

Calibration procedure

INITIALISATION
1 Set up AF FFT
1 Set fft ref freq = 5 kHz and span 1 kHz / div
1 Set fft vertical scale 10 dB/div
1 Select ground for A2/A3 CAL signal
1 Route CAL ground signal into A3 AF path input
1 Screen message: "Initialised for FFT DC marker suppression"
1 #BP 10000

GET STARTING POINT MEASUREMENTS
2 Set first offset start value
2 Screen message: "Requesting measurement, offset = xxxx"
2 Request fft marker 1 reading at ordinate 1 (DC marker position)
2 MARKER READING RETURNED
2 #BP 50000

```
2       Save first DC marker level reading
2       Set second offset start value
2       Screen message: "Requesting measurement, offset = xxxx"
2       Request fft marker 1 reading at ordinate 1 (DC marker position)
2       MARKER READING RETURNED
2       #BP 50001
2       Save second DC marker level reading
2       Set third offset value
2       Screen message: "Requesting measurement, offset = xxxx"
2       Request fft marker 1 reading at ordinate 1 (DC marker position)
2       MARKER READING RETURNED
2       #BP 50002
2       Save third DC marker level reading
2       Screen message: "Starting point measurements done"
2       #BP 50003

        SET DC NULL TEST POINT
3       Test data points to see in minimum DC marker level found
3       IF null found
4               Screen message: "Finished FFT DC offset nulling"
4               Save A5 ADC offset value & download to A5
4               #BP 50004
4               END
3       ELSE null not found
5               Set new test point offset on A5
5               Screen message: "Requesting measurement, offset = xxxx"
5               Request fft marker 1 reading at ordinate 1 (DC marker position)
5               MARKER READING RETURNED
5               #BP 50005
5               Screen message: "Offset = xxxx, reading = xxxx",
5               #BP 50006
5               END
```

AF FFT gain offsets calibration

Purpose

This calibration function is used to calibrate the gain offsets for the AF FFT.

Description

The calibration is performed by routeing a 1 kHz signal at defined levels to the AF FFT system using the A2/A3 CAL signal path. The reference levels that are calibrated, the order in which they are done, and the test levels used to calibrate them are shown in the following table; where possible, the test level is 90% of top of screen:-

Range	Ref level (T.o.S.)	Test level
00	2 mV	1.8 mV
01	5 mV	4.5 mV
03	20 mV	18 mV
04	50 mV	45 mV
05	100 mV	90 mV
06	200 mV	180 mV
07	500 mV	450 mV
08	1 V	900 mV
09	2 V	1.8 V
10	5 V	4.5 V
11	10 V	5 V
12	20 V	5 V
13	50 V	5 V

Gain offsets are in hundredths of a dB.

Calibration procedure

INITIALISATION
1 Set AF FFT range gains to nominal (20)
1 Select AF input to FFT
1 Select AF input to speaker
1 Set FFT span 1 kHz / div
1 Set vertical scale to 10 dB / div
1 Reset all A1 audio and mod generators•
1 Set audio gen 1 frequency to 1 kHz
1 Select A1 audio gens as A1 AFREF signal
1 Route af gen output to CAL signal
1 Screen message: "Initialised for AF FFT offset CAL"
1 #BP 10000

SET TEST LEVEL
2 Set A1 output level to test level for FFT range (2 mV range first)
2 Set FFT range
2 Screen message: "Ref level : XXXmV, AF level XXXX.XmV"
2 #BP 51XX0 (where XX is range under test, see above)

READ PEAK LEVEL
3 Request FFT marker peak find
3 Screen message: "Made peak find request"
3 Request FFT marker level reading
3 Screen message: "Requested marker reading"
3 FFT MARKER LEVEL READING RETURNED
3 #BP 51XX1 (where XX is range under test, see above)
3 Calculate error between marker reading and levelset
3 Screen message: "XXXmV range, error = XX.XXXX, offset XX"
3 IF error inside limits
4 Adjust offset for error and store
4 IF all ref levels calibrated
5 #BP 51002
5 END
4 ELSE more levels to calibrate
6 #BP 51XX3 (where XX is range under test, see above)

6 REPEAT from section 2 for next ref level
3 ELSE error outside limits
7 Adjust offset
7 Screen message: "<range> range, error xx.xxx, setting xxx"
7 Set FFT range to implement new offset
7 #BP 51XX4 (where XX is range under test, see above)
7 REPEAT from section 3

FM demod FFT gain offsets calibration

Purpose

This calibration function is used to calibrate the gain offsets for the FM demod FFT.

Description

This calibration works by relying on the accuracy of the 1-bit ADC low-frequency FM generation in the signal generator. For various demod FFT reference levels (as shown in the table below), a test deviation is set up and measured on the FFT. The gain offset for the FFT range is adjusted until the error between the reading and the setting is less than 0.01 dB.

Range	Ref level	Test dev (Hz)
00	400 Hz	360
01	800 Hz	720
02	2 kHz	1800
03	4 kHz	3600
04	8 kHz	7200
05	20 kHz	18000
06	40 kHz	36000
07	80 kHz	72000
08	200 kHz	100000
09	400 kHz	100000

Calibration procedure

INITIALISATION
1 Set default FM fft offsets (35)
1 FFT ref level under test = 400 Hz
1 Switch on FFT
1 Route demod to FFT
1 Set FFT span per div to 100 Hz
1 Set FFT vertical scale 10 dB per div
1 Select single-port duplex mode on N-type connector
1 Set RF gen frequency and receiver frequency to 150 MHz
1 Switch on RF generator
1 Set RF generator level to –27 dBm at N-type connector
1 Select 3 MHz IF filter
1 Set 20 dB at RF input attenuator
1 Set mod frequency to 100 Hz
1 Route A3 FM demod input to A3 demod filter path
1 Select 300 Hz low-pass filter in demod filter path
1 Screen message: "Initialised demod FFT calibration"
1 #BP 10000

SET DEMOD TEST LEVEL
2 Set FM deviation test level for range under test

2 Set FFT reference level for range under test
2 Screen message: "Ref level: <ref level>, FM level xx.x kHz",
2 #BP 55XX0 where XX is range under test (see table above)

REQUEST FFT PEAK FIND
3 Request marker peak find and level reading
3 Screen message: "Made peak find request"
3 FFT MARKER READING RETURNED
3 #BP 55XX1 where XX is range under test (see table above)
3 Calculate error between reading and set level target
3 Screen message: "<ref level> range, error xx.xxx, offset = xx"
3 IF error in limits (0.01 dB)
4 IF more ref levels to calibrate
5 #BP 55XX2 where XX is range under test (see table above)
5 REPEAT from section 2 for next ref level
4 ELSE all done
6 #BP 55999
6 END
3 ELSE need to check this range again
7 Set new calculated gain offset for current range
7 Screen message: "<ref level> range, error xx.xxx, setting xx"
7 #BP 55XX3 where XX is range under test (see table above)
7 REPEAT from start of section 3

Power meter calibration

Broad-band power meter calibration (gain and offsets)

Purpose

The purpose of the power meter calibration routines is to find offsets for each of the four power meter ranges, and the gain of the power meter.

Description

The offset calibrations are performed by grounding the input to the power meter and instructing A5 to perform an offset measurement, the result of which is returned to A6.

The power meter gain calibration is performed by routeing the RF calibrator signal (10 MHz, 0 dBm) to the power meter via the input switch. A5 is instructed to perform a gain reading, the result of which is returned to A6.

Offset calibration procedure (performed for each of four ranges)

INITIALISATION
1 Select power meter CAL path in input switch.
1 Switch RF calibrator OFF (input to power meter is grounded)
1 Set power meter range for offset calibration
1 Screen message: "1. Initialised offset x"
1 #BP 10000

START OFFSET MEASUREMENT
2 Screen message: "2. Reading offset x"
2 Request power meter offset reading from A5
2 #BP 17000
2 DAC offset and ADC offset returned from A5
2 Update power meter offset data
2 #BP 17001
2 Screen message: "3. Offset x updated"
2 END

Gain calibration procedure

1	Set input switch to route RF calibrator output to power meter input
1	Switch on RF calibrator
1	Set power meter range 1, to read 0 dBm
1	Screen message: "5. Initialised gain CAL"
1	#BP 10000
	START POWER METER GAIN
2	Request A5 power meter gain calculation
2	Screen message: "6.Requested gain reading"
2	Gain reading returned from A5
2	#BP 17010
	READ PM GAIN
3	Screen message: "6.Gain received & updated"
3	#BP 17011
3	END

Audio generator calibrations

AM gain calibration

Purpose

This calibration is used to set the gain value used on A1 for scaling the internal mod levels for AM generation.

Description

When carrier is amplitude modulated at 63.2% by a 1 kHz mod signal, the sidebands are separated from the carrier by 1 kHz, and are 10 dB down on the carrier level. This calibration uses such a set up to measure the error in the carrier-to-sideband difference, using the log amp with a 300 Hz IF filter. From this error, the AM gain scaling figure on A1 can be adjusted to correct gain errors. To ensure the log amp readings are not affected by non-linearity in the log amp, when measuring the sideband level, the signal generator output attenuation is reduced by 10 dB to bring the sideband up to the point on the log amp where the carrier level was measured. Further, the change in attenuation is measured accurately by using the broad-band power meter. There are four paths on A1 through which AM drive may be generated (see A1 technical description for details); each of these is calibrated.

Calibration procedure

	INITIALISATION
1	Set RF input switch to single-port duplex mode on N-type connector
1	Switch off all mod sources
1	Select Vref as RF level reference
1	Set RF generator freq 36 MHz
1	Set 0 dB in output attenuator
1	Set AF5 output level +5 dBm
1	#BP 10000
	GET ATTENUATOR OUT LEVEL
2	Screen message: "Requested power reading X"
2	Request broad-band power measurement
2	POWER READING RETURNED
2	#BP 18000
2	If power meter over- or under-ranged
3	Flag CAL as failed
8	Screen message: "Cal failed, check power meter CAL
3	#BP 18001
3	END
2	ELSE power meter in range

```
4                   IF more readings to take
5                       REPEAT from start of section 2
4                   ELSE all readings done
6                       Calculate average power reading
6                       Screen message: "Found reading, atten out, =  xxxx dBm*100"
6                       Set 10 dB in output attenuator
6                       #BP 18002

                GET ATTENUATOR IN LEVEL
7               Screen message: "Requesting first read for attenuator in"
7               Request broad-band power measurement
7               POWER READING RETURNED
7               #BP 18003
7               If power meter over- or under-ranged
8                   Flag CAL as failed
8                   Screen message: "Cal failed, check power meter CAL
8                   #BP 18004
8                   END
7               ELSE power meter in range
9                   IF more readings to take
10                  REPEAT from start of section 7
9                   ELSE all readings done
11                  Calculate average power reading
11                  Calculate attenuator step for 10 dB change in setting
11                  Screen message: "Found attenuator step = xxxx dBm*100"
11                  #BP 18005

                INITIALISE FOR AM GAINS
12              Set AF5 output level to +7 dBm
12              Set input attenuation to 40 dB
12              Switch sensitive receiver off
12              Select 300 Hx IF filter
12              Connect Vref/2 as RF level reference
12              Screen message: "Initialised AM gains CAL"
12              #BP 18006

                START CARRIER MEASUREMENT
13              Set Tx freq 36 MHz
13              Set output attenuation 10 dB
13              Screen message: "Initialised for carrier read, path x"
13              Set mod gen freq 1 kHz for A1 modulation path under test
13              Set AM depth to 63.2%
13              #BP 18X07 (where X is 0, 1, 2 or 3 for path under test)

                MEASURE CARRIER LEVEL
14              Request narrow-band power measurement
14              Screen message: Requesting first carrier read, path x"

                READING RETURNED
15              #BP 18X08 (where X is 0, 1, 2 or 3 for path under test)
15              Screen message: "AM gain x, carrier level x = xxxx dBm (x100)"
15              IF more readings to take
16                  Request narrow-band power measurement
16              REPEAT from section 15
15              ELSE all readings done
17                  Calculate average power level for carrier signal
17                  Screen message: ""Starting sideband measurement, path x"
17                  Set Tx freq 35.999 MHz
17              Set output attenuator to 0 dB
17              #BP 18X09 (where X is 0, 1, 2 or 3 for path under test)
```

MEASURE SIDEBAND LEVEL
18 Screen message: "Requesting sideband read, path x"
18 Request narrow-band power reading

READING RETURNED
19 #BP 18X10 (where X is 0, 1, 2 or 3 for path under test)
19 Screen message: "AM gain x, SB level x = xxxx dBm (x100)"
19 IF more readings to take
20 Request narrow-band power measurement
20 REPEAT from section 19
19 ELSE all readings done
21 Calculate average power level for carrier signal
21 Calculate AM gain scaling for path under test
21 Screen message: "AM gain CAL value %u = %x"
21 IF more A1 mod paths to calibrate
22 #BP 18X11 (where X is 0, 1, 2 or 3 for path under test)
22 Select next mod path
22 REPEAT from section 13
21 ELSE all mod paths done
23 #BP 18X12 (where X is 0, 1, 2 or 3 for path under test)
23 END

CAL FAILURE: #BP 18001, #BP 18004

Phase modulation generation gain calibration

Purpose

The purpose of the calibration is to determine the A1 scaling value required to produce correctly levelled audio signals for the PM drive.

Description

Given that the generation of phase mod drive signals is no different for A1 than generating FM drive signals, this calibration works by setting up a signal on the FM path on A1 and routeing it from A1 to the RMS-DC converter and ADC on A2. This signal is measured. An equivalent PM drive level is set up and measured. The difference between the two DC readings allows a correction to be made to the phase mod drive scaling so that the phase mod drive is the same level as the FM drive.

Calibration procedure

INITIALISATION
1 Connect Vref as RF level reference
1 Select A1 FM mod path as AFREF
1 Route AFREF to A2/A3 CAL signal
1 Select RMS-DC converter output as input to A2 ADC
1 Select CAL signal as input to RMS-DC converter
1 Screen message: "PM gain initialised"
1 #BP 10000

START FM DRIVE MEASUREMENT
2 Route required gen source to FM output on A1
2 Select FM on A1
2 Set mod frequency to 5 kHz, half scale on A1 gain
2 Screen message: "Initialised for FM drive level check"
2 #BP 17500

MEASURE FM DRIVE LEVEL
3 Screen message: "Requesting first read for FM drive"
3 Request A2 ADC reading
4 ADC READING RETURNED
3 #BP 17501

```
4       Screen message: "FM drive reading x = xxxx"
4       If more readings to take
5               Request A2 ADC reading
5               REPEAT from section 4
4       ELSE all readings done
6               Calculate average reading for FM drive signal
6               Screen message: "FM drive level reading = xxxx"
6               #BP 17502

        SUCCESSIVE APPROXIMATION ON PM GAIN SCALING
7       FOR EACH OF 16 BITS IN PM GAIN SCALING:
8               Set PM gain value
8               Screen message: "OR = xxxx, LOAD = xxxx"
8               #BP 17503
8               Request A2 ADC reading
8               Screen message: "Requesting first read for pm drive"
9               ADC READING RETURNED
9               #BP 17504
9               Screen message: "PM drive reading x = xxxx"
9               IF more readings to take
10              Request A2 ADC reading
10              REPEAT from section 9
9               ELSE all readings done
11              Calculate average PM drive level reading
11              Screen message: "PM drive level reading = xxxx"
11              #BP 17505

        END OF SUCCESSIVE APPROXIMATION
12      Check PM drive reading in limits  (+/- 3 lsb)
12      IF reading OK
13              Flag CAL as passed
13      Screen message: "Passed PM gain CAL..."
13              #BP 17506
12      ELSE
14              Flag CAL as failed
14      Screen message: "Failed PM gain CAL..."
14              #BP 17507
12      END

CAL FAILURE: #BP 17507
```

Chapter 5
FAULT DIAGNOSIS

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Introduction

This chapter provides:-

- A quick fault-finding guide for digital systems
- Information about the diagnostics that can be run from HELP SET-UP

Quick fault-finding guide - digital systems

The following sequence is the simplest way to narrow down faults with the digital systems hardware when working on the 2966A:-

1. **Power on**
2. **Select [SYSTEMS]**
3. **Select *[GSM]***

Message: DSC failure Cannot load kernel

Indicates that A6/2 was unable to set up A4. Is:-

- The instrument set up as a 2966A with A4 fitted ?
- A6/2 <-> A4 interconnect OK ?

Message: DSP exception 0x01 : boot error
<*map*> <*rdp*> <*igp*> <qg*p*> failed to boot

Reports that one or more of the DSPs has failed to boot.

Use the HELP SET-UP diagnostics see page 5-2.

4. **Select [DUPLEX TEST], *[duplex test (Tx)]*, *[spec ana]*, [Rx=Tx FREQ], [▼ *ref level* ▲]**

Adjust reference level for maximum sensitivity. You should see the characteristic GMSK spectrum and, if you expand and select max hold, you should be able to spot the FCCH 'spike' 67.7 kHz above the carrier frequency.

If 67.7kHz 'spike' not present:-

Are generator I,Q in quadrature?

Set oscilloscope to 1 V pk-pk in X-Y mode and probe A8 TPs 55(I) and 56(Q). A near perfect circle should be seen. If a straight line is seen, I or Q is failing. If a strange, square, web-like pattern is seen, then I,Q are not in sync. Suspect SPORT loop / resets to I and Q FIFO chips.

Is SPORT loop connected ? (run diagnostic)

5. Select [SYSTEMS], *[MANUAL]*

6. Connect a mobile and switch on

Is registration attempted?

Measurements on access bursts will be displayed on Digital Duplex screen. The mobile's service 'light' may flash.

No. Suspect 10MHz standard reference or 78MHz PLL

Does registration succeed?

No. Suspect receiver -- check SPORT loop (run diagnostic) and IF.

Use bursty loop-back mode to provide signals for probing the IF. Note that the bursty loop-back power profile will fail the mask -- **this is not a fault**.

Yes. Registration may succeed, but *[place call]* may fail.

If the BCCH and TCH channels differ and place call fails, suspect RF SYNC failure.

Finally, select [DUPLEX], *[tx test]*, *[power ana]*, *[full burst]*. Is the trace updated? If not, suspect SPORT connector between A8 and A4.

HELP SET-UP diagnostics

Introduction

To bring up the DIAGNOSTICS menu, press the following keys:-

[HELP SET-UP], *[Marconi Access]*, *[DIAGNOSTICS]*

This menu provides access to tests on digital systems, the AB3 mixer module, step attenuators, I2C devices, front panel (twiddly) controls (VOLUME, SQUELCH, SCOPE POS), and debug flags.

This chapter deals with the first of these, i.e. digital systems. The others are self-explanatory.

Digital systems

Press the *[DSC]* key. This brings up the digital system options.

[DSC DIAGS]

Allows you to run the A4/A8 diagnostic tests. The following subsections describe in detail the diagnostics that are provided. Each subsection includes a brief statement of the purpose of the diagnostic, instructions about its use and an explanation of the information that it provides.

A single shot diagnostic is run once when invoked. A continuous diagnostic runs repeatedly until stopped.

To run a test, use the *[UP]*, *[DOWN]*, *[PAGE UP]*, *[PAGE DOWN]* keys, or the VARIABLE rotary control, to highlight the required test, and then press *[SELECT]*. Alternatively enter the number of the required diagnostic followed by [ENTER] on the numeric keys. The message sent to A4 to run the test is displayed along with the results of the test.

Note that if A4 or A8 is faulty, it may not be possible to run certain diagnostic tests. In particular, if there is a problem booting a DSP, it is unlikely that it will be possible to run any diagnostic tests on that DSP. It may also be necessary to reset the test set if a fault causes unpredictable operation to occur.

The 'K' and 'G' prefixes indicate if the diagnostic is located in the A4 kernel or the GSM application, respectively, on A4. If it is not possible to initialise the GSM application, or the GSM application has not been downloaded to A4, it may not be possible to run the diagnostics in the GSM application. Diagnostics located in the kernel are available at all times unless prevented by a fault.

K 01 A6 ↔ A4 Bridge Test

Tests that the A6 ↔ A4 bridge is working by sending a set of 'Y' commands to A4. 'Y' commands are sent straight back to A6 in the form in which they were received. The commands sent and the responses received are displayed.

Possible results

1. Display of sent and received commands are the same, indicating that the test has been successful
2. Display of sent and received commands are not the same, indicating that there is a problem with the bridge

K 02 Protocol Processor Host (PPH) Booting Test

Tests that the PPH will boot up with no errors. This diagnostic has the same effect as selecting [SYSTEMS] followed by *[GSM]* in normal operation.

Possible results

1. Done
2. Error message in a window, which indicates an error that occurred during the boot up process

The Done message indicates that the booting process has been completed with no errors.

K 03 PPH Flash Checksum Test

Verifies operation of the Flash ROMs on A4. This is done by calculating the checksum of the ROMs and comparing it with the checksum value that was stored in the ROMs when the current application was downloaded to A4.

Possible results

1. Test passed
2. Test failed

K 04 PPH RAM Test

Verifies operation of the PPH RAM on A4 using algorithms that test the address and data lines to the RAM devices and the ability of the devices to store data.

Possible results

1. Test passed
2. Test failed: error code = *xx*

The error code is a bit-mapped byte value, displayed in hexadecimal, which indicates which parts of the test failed. 0 indicates that a part of the test passed, 1 indicates that it failed. The bits represent parts of the test as follows:-

Bit 0	Address line test result
Bit 1	Data line test result
Bit 2	Bit test result
Bits 3 - 7	Not used

K 05 PPH Peek Function

Allows the contents of PPH storage to be examined in blocks of up to 16 bytes.

Possible results

1. PPH peek data: *xx*
2. Bus error occurred - kernel reset

The number of bytes of peek data displayed corresponds to the number of bytes requested.

The bus error message will occur if the address entered by the user is not a valid address. The kernel is reset to allow digital systems operation to continue.

K 06 PPH Poke Function

Allows the contents of PPH storage to be set to specific values.

Possible results

1. Done
2. Bus error occurred - kernel reset

The Done message indicates that no errors occurred during the poke process.

The bus error message will occur if the address entered by the user is not a valid address. The kernel is reset to allow digital systems operation to continue.

K 08 Continuous Poke and Peek Of PPH Memory Location

Allows a PPH memory location to be continuously written to and then read back from so that an oscilloscope/logic analyzer may be used to diagnose problems.

Possible results

1. Diagnostic running
2. Bus error occurred - kernel reset

The Diagnostic running message indicates that the continuous poke and peek is in operation.

The bus error message will occur if the address entered by the user is not a valid address. The kernel is reset to allow digital systems operation to continue.

Note that a continuous poke then peek may not be performed on the Flash ROMs.

K 09 PROTO, STE And FIFO LCA Configuration Test

Configures the Xilinx devices, i.e. the PROTO LCA (A4 IC6), the FIFO LCA (A8 IC57) and the STE LCA (A8 IC61).

Possible results

1. Test passed
2. Test failed: error code = *xx*

The error code is a numeric value having the following possible meanings:-

01 = DNP line did not go high at the end of the programming sequence

02 = INIT line did not go high after LCA reset at start of programming sequence

03 = PRDY line did not go high after configuration byte written to LCA

04 = LDC line did not go high at the end of the programming sequence

05 = LCAs failed to hold DNP line low after DNP line pulsed low to program LCAs

06 = INIT line remained high at end of programming sequence - CRC check failed

G 10 A8 DSP Bridge FPGA Configuration Test

Verifies the configuration process for the DSP bridge FPGAs, A8 IC30, IC36, IC44 and IC53. This is done by configuring the devices and then reading back the configuration data and checking that it is the same.

Possible results

1. Test passed
2. Test failed: error code = *xx*

The error code is a numeric value which indicates which device was being tested when the test failed and it has the following values:-

01 = RDP bridge FPGA, A8 IC53

02 = MAP bridge FPGA, A8 IC44

03 = QGP bridge FPGA, A8 IC36

04 = IGP bridge FPGA, A8 IC30

K 11 STE Read/Write Test

Verifies operation of the registers and memory locations in the STE using algorithms which test the address and data lines to the device.

Possible results

1. Test passed
2. Test failed: error code = *xx*

The error code indicates the nature of the failure and has the following values:-

01 = address line error

02 = data line error

G 12 Programmable Interval Timer (PIT) & Interrupt Test

Verifies that the PIT and interrupt circuitry work correctly by configuring the three counters in the PIT to generate interrupts and loading interrupt handlers to indicate when an interrupt has been received.

Possible results

1. Test passed
2. Test failed: error code = *xx*

The error code is bit-mapped byte value displayed in hexadecimal which indicates which counter interrupts failed. 0 indicates that no interrupt was received from the corresponding counter, 1 indicates that an interrupt was received. The bits represent counter interrupt status as follows:-

Bit 0 - Counter 0 interrupt status

Bit 1 - Counter 1 interrupt status

Bit 2 - Counter 2 interrupt status

Bits 3 - 7 not used

G 13 DSP Booting Test

Tests that an individual DSP boots up with no errors.

Possible results

1. Test passed
2. Test failed: error code = *xx*

The error code is a bit-mapped byte value displayed in hexadecimal which indicates the error condition which occurred in the DSP booting process. 0 indicates that an error condition did not occur, 1 indicates that an error condition occurred. The bits represent errors in parts of the booting process, as follows:-

Bit 0 - Error found in address in boot data for DSP

Bit 1 - Missing 'end of section' marker in boot data for DSP

Bit 2 - DSP failed to read first byte of boot data

Bit 3 - DSP failed to read subsequent byte of boot data

Bit 4 - DSP failed to read last byte of boot data

Bit 5 - DSP did not respond to last byte of boot data with error message

Bit 6 - DSP responded to last byte of boot data but did not send error message

Bit 7 - not used

G 14 DSP Short Boot Test

Sends a user-defined byte of data repeatedly on the bridge of a DSP to allow an oscilloscope/logic analyzer to be used to test the bridge data lines.

Possible results

1. Diagnostic running

The Diagnostic running message indicates that the byte value is being sent on the DSP bridge.

G 15 DSP Diagnostic Application Checksum Test

Tests the checksum of the DSP diagnostic application once the application has been loaded into a DSP.

Possible results

1. Test passed
2. Test failed

G 16 DSP Bridge Test

Tests the bridge between the PPH and a DSP in both directions.

Possible results

1. Test passed
2. Test failed

G 18 DSP Memory Test

Verifies the operation of the external program and data memory of a DSP using algorithms which test the address, data and page select lines to the devices.

Possible results

1. Test passed
2. Test failed: error code = *xx*

DSP memory test errors are sent back in groups of three digits, each digit representing the test result for a part of the test. The digits in each group have the following meanings:-

First digit Data line test result	Second digit Page test result	Third digit Address line test result
0 = passed	0 = passed	0 = passed
1 = failed	1 = failed	1 = failed
2 = not attempted	2 = not attempted	2 = not attempted

For DSPs with paged memory, the results are sent back as three groups of three digits. For DSPs without paged memory, the results are sent back as two groups of three digits. The groups have the following meanings:-

	First group	Second group	Third group
Paged memory	Result for external data memory pages 0 and 1	Result for external program memory	Result for external data memory pages 2 and 3
Non-paged memory	Result for external data memory	Result for external program memory	-

Examples

Error 000 102 000	DSP with paged memory, external data memory pages 0 - 3 passed tests, external program memory failed data line test, and address line test not attempted.
Error 000 000 012	DSP with paged memory, external data memory pages 0 and 1 passed tests, external program memory passed tests, external data memory page test failed, and address line test not attempted
Error 000 001	DSP with non-paged memory, external data memory passed tests, external program memory failed address line test
Error 102 000	DSP with non-paged memory, external data memory failed data line test, and address line test not attempted, external program memory passed tests.

G 19 DSP Peek Function

Allows the contents of DSP program and data memory to be examined in words.

Possible results

1. Peeked value = *xxxxxx*

G 20 DSP Poke Function

Allows the contents of DSP program and data memory to be set to specific values.

Possible results

1. Done

The Done message indicates that the data supplied has been written to the address indicated.

G 21 Continuous Poke Then Peek Of DSP Memory Location

Allows DSP memory location to be continuously poked then peeked, so that an oscilloscope/logic analyzer may be used to probe R/W and memory decode signals.

Possible results

1. Diagnostic running

The 'Diagnostic running' message indicates that the continuous poke then peek is in progress.

G 22 DSP Serial Comms Connectivity Test

Tests that DSP serial communications interfaces work correctly.

Fig. 5-1 shows the way in which the DSP serial port links are interconnected for this test. The PPH instructs the DSP at the sending end of a link to send a value. The DSP at the receiving end of the link reports the value that it received to the PPH. If the values match, the PPH indicates that the link is working, otherwise it indicates that the link is not working.

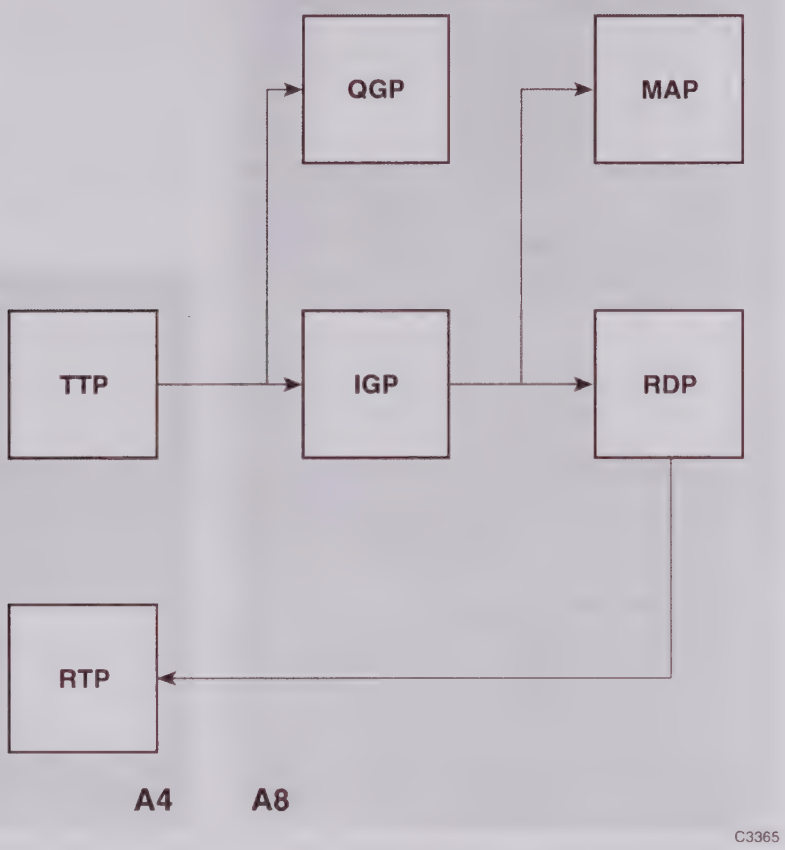

Fig. 5-1 DSP serial communications test

Possible results

1. Test passed
2. Test failed: error code = *xx*

The error code is a bit-mapped byte value, displayed in hexadecimal, which indicates which serial port links did not work correctly. 0 indicates that the link worked, 1 indicates that it did not work.

The bits represent serial port links, as follows:-

Bit 0 - Serial port link between TTP and IGP

Bit 1 - Serial port link between TTP and QGP

Bit 2 - Serial port link between IGP and RDP

Bit 3 - Serial port link between IGP and MAP

Bit 4 - Serial port link between RDP and RTP

Bit 5 - 7 not used

G 23 DSP Serial Comms Test Pattern Test

Causes the DSP serial communications ports to produce a test pattern to allow the SPORT lines to be tested using an oscilloscope.

The DSP serial port links are interconnected as for diagnostic 22. The TTP is the source of the test pattern. All the other DSPs are set up to transmit on their transmit serial ports whatever they receive on their receive serial ports. In this way the serial port interconnections may be easily tested with an oscilloscope by verifying that the pattern which a DSP transmits is the same as the pattern which is being transmitted by the TTP. Note that each DSP delays the test pattern slightly.

Possible results

1. Diagnostic running

The 'Diagnostic running' message indicates that the DSP serial communications ports are producing a test pattern.

K 24 A8 Transmitter IF Attenuator Control

Sets A8 transmitter IF attenuator control DAC level to allow voltages in the attenuator control circuit to be measured.

Possible results

1. Done

The 'Done' message indicates that the A8 transmitter IF attenuator control DAC has been set to the value indicated.

G 30 AGC DAC Ramp Test

Causes the MAP to output ramps on the AGC DAC outputs to allow DAC operation to be examined with an oscilloscope.

The ramp on one DAC has a positive slope and the ramp on the other has a negative slope.

Possible results

1. Diagnostic running

The 'Diagnostic running' message indicates that the AGC DACs are being written to produce ramps at their outputs.

K 31 Output Attenuator DAC Ramp Test

Causes the PPH to output a ramp on the IF transmitter output attenuator DAC to allow DAC operation to be examined with an oscilloscope.

Possible results

1. Diagnostic running

The 'Diagnostic running' message indicates that the IF transmitter output DAC is being written to produce a ramp at its output.

Development aids

Note: The other soft key options are mainly intended as aids for development work. Their use by the uninitiated is **not** advisable. However, since in some instances they could be used for test purposes by testers with a good understanding of how the test set functions, they are described briefly below, with the proviso that Marconi Instruments cannot be held responsible for their misuse.

[A4 TEST MODE]

[digital cw mode] initialises the digital systems for calibration verification. This allows the calibration of the digital parts of the test set to be verified. In this mode, the MAP measures power only, and performs this measurement on continuous wave signals. A signal of known power level is fed into the test set from a signal generator and the test set's power measurement is checked against it to verify that the test set calibration is correct.

[digital dx mode] initialises the digital systems for normal (GSM) mode. This is used in conjunction with *[bursty on OFF]*.

[dsc fft] initialises the digital systems MAP with a Fast Fourier Transform algorithm which allows the frequency response of the receiver to be examined. A frequency spectrum 1.2 MHz wide is displayed with the test set's receiver frequency at the centre.

[bursty on OFF] allows measurements of the GSM signal generator to be made by the receiver on A8. Since the A8 receiver can only perform measurements on bursty signals, the signal generator is configured to produce bursty output. This soft key must be followed by the *[digital dx mode]* soft key. Once in digital duplex test mode, pressing the [Rx=Tx FREQ] key causes the signal generator output to be fed back into the receiver chain, allowing it to be measured.

[load kernel] forces the kernel to load.

[exit digital] followed by [HELP SET-UP], *[return]*, returns you to normal DUPLEX mode.

[A4 LOAD OPTIONS]

Allows a new GSM application to be downloaded to the digital systems from A6. This may be required in the following circumstances:-

- When new digital systems boards A4 and A8 have been fitted for the first time, in production or as a result of service work, the Flash ROMs on the A4 card will not contain the GSM application.
- When the A6 software has been upgraded, the GSM application in the Flash ROMs on the A4 card may be the wrong version.
- The GSM application in the Flash ROMs on the A4 card may have been corrupted for some reason; for example, as a result of one of the ROM devices being changed.

This utility downloads the GSM application that is stored in the A6 software to A4/A8, verifying that the programming has been carried out correctly in the process.

[A8 rx agc]

Allows the operation of the receiver AGC and trigger on A4/A8 to be controlled; this is mainly used for software development.

The MAP on A8 has an upper and lower limit of power readings (referred to as a 'window') which it can bring to the standard 1 V peak-to-peak level using the receiver AGC. If the signal level arriving at A8 is outside the window, it is necessary for the bulk attenuators to be changed to modify the signal level. When auto-levelling is in operation, the MAP signals to A6 that the bulk attenuators need to be changed and A6 changes them accordingly. The lower limit of the window is set during calibration - the upper limit is fixed in the MAP code.

In addition, the MAP has a trigger system that detects if a burst is present or not. The trigger level is automatically modified according to a set of rules which aims to keep it at the most appropriate level at all times.

[change window] displays the current value of the lower window limit in the MAP. **Note:** This key is for development use only. Do **NOT** change this setting.

[autolev ON off] allows auto-levelling to be turned on and off.

[debug on OFF] Enable/disable A8 AGC debug allows the current AGC value to be displayed on the top line of the Digital DUPLEX TEST and Systems MANUALTEST screens.

[debug on OFF] Enable/disable MAP autotrig allows the MAP automatic trigger level adjustment to be turned on or off.

[meas diags]

Allows the Tx measurements from A4/A8 to be displayed in full, including information that is useful for debugging. Information displayed on this screen is as follows:-

BURST	Type of burst measured.
FRAME	Frame number when burst was measured.
TAG	Measurement tag value. Each measurement request and each measurement response includes a tag which A6 uses to match up requests and responses.
STATUS	Measurement status flags from MAP.
AGC STATUS	Flags which indicate if the AGC is able to bring the received power level to the standard 1 V peak-to-peak level.
SETTLING	Flags which indicate if the peak worst case/average measurement processing has settled.
TX POWER	Burst power level.
AGC 1 & 2	AGC DAC setting used in making the power measurement.
GAIN	Gain corresponding to AGC DAC setting.
DSP	DSP measured power - nominally –6 dBm.
ATTEN	Current level of attenuation including bulk attenuators and A8 AGC.
OFFSET	RF input level offset.
PROFILE	Indication of whether or not the burst power level was within the standard profile for the burst type.
TX PHASE	RMS and peak burst phase measurements.
TX FREQ	Burst frequency measurement.
TX TIMING	Burst.

[TTP msg errors]

Allows the last 0x23 exception message from the TTP to be displayed.

Chapter 6
REPLACEABLE PARTS

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Introduction

Each sub-assembly or printed circuit board in this equipment has been allocated a reference designator code, e.g. A0, A1, A2 etc.

The complete component reference includes its reference designator as a prefix e.g. A2C1 (capacitor C1 on sub-assembly A2) but for convenience in the text and diagrams, the prefix is omitted unless it is needed to avoid confusion. However, when ordering replacements or in correspondence, the complete component reference should be quoted.

Component values

One or more of the components fitted in the equipment may differ from those listed in this chapter for any of the following reasons:-

(a) Components indicated by an * (or SIC) have their values selected during test to achieve particular performance limits.

(b) Owing to supply difficulties, components of different value or type may be substituted provided the overall performance of the equipment is maintained.

(c) As part of a policy of continuous development, components may be changed in value or type to obtain detail improvements in performance.

When there is a difference between the component fitted and the one listed, always use as a replacement the same type and value as found in the equipment.

Ordering

When ordering replacements, address the order to our Service Division (address at rear of manual) or nearest agent and specify the following for each component required:-

Type and serial number of equipment, as given on the serial number label at the rear of the equipment. If this is superseded by a model number label, quote the model number instead of the type number.

(2) Complete circuit reference.

(3) Description.

(4) Part number.

Electrical components

AR1 10 MHz OCXO

When ordering, prefix circuit reference with AR1.

44829-827 Complete unit Issue 13

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
C1 to C3	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C4	26421/143	CAPACITOR-FIXED ALUMINIUM 470uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-U-471-B
C5	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C6	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C7	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C8	26386/871	CAPACITOR-FIXED CERAMIC 4.7nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-472-KP
C9	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C10	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C11	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C12	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C13	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C14	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C15	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C16	26386/871	CAPACITOR-FIXED CERAMIC 4.7nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-472-KP
C17	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C18	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C19	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C20 to C23	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C24 to C28	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C29	26421/106	CAPACITOR-FIXED ALUMINIUM 1uF +/-20% 50V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1H-KA-010-B
C30	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AR1	**10 MHz OCXO (contd.)**			
D1	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D2	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D3	28371/494	DIODE VOLTAGE REFERENCE, 1N825... 250mW 6.2V 5% 50mA 20ppm/DEG.C, AXIAL, DO-7, (TAPED).	PHILIPS	1N825
D4 to D6	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D7	28371/303	DIODE ZENER, BZX84-C6V2... 350mW 6.2V 5% 250mA MARKING CODE Z4, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C6V2
D8	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
IC1	28461/896	IC-ANALOGUE SWITCH DG413... QUAD, 15V SPST, ON-RESISTANCE<35R, 2 x N/O & 2 x N/C @ LOGIC 1,	TEMIC UK LTD	DG413DY
IC2	28469/026	IC-DIGITAL INVERTER 74HCT04... HEX, CMOS-H/SPEED+TTL, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HCT04D
IC3	28469/026	IC-DIGITAL INVERTER 74HCT04... HEX, CMOS-H/SPEED+TTL, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HCT04D
IC4	28469/543	IC-DIGITAL COUNTER 74HC390... 4 BIT, DUAL, DECADE RIPPLE, CMOS-H/SPEED, 16 PIN, SMALL-OUTLINE.	PHILIPS	74HC390D
IC5	28466/393	IC-DIGITAL NAND-GATE 74HC132... 2 INPUT, QUAD, SCHMITT TRIGGER, CMOS-H/SPEED, 14 PIN,	PHILIPS	74HC132D
IC6	28461/413	IC-ANALOGUE OPERATIONAL AMP TL074... QUAD, JFET INPUT, LOW NOISE, SLEW RATE 8V/uS MIN, GAIN	MOTOROLA INC.	TL074CD
IC8	28461/388	IC-ANALOGUE OPERATIONAL AMP LM324D... QUAD, GEN-PURPOSE, SLEW RATE 0.2V/uS MIN, GAIN BANDWIDTH	PHILIPS	LM324D
IC9	28461/734	IC-ANALOGUE VOLTAGE-REGULATOR 78L05AC... 5V 100mA POSITIVE, LINEAR, 5% REGULATION, MONOLITHIC, 3	NAT. SEMICONDUCTOR	LM78L05ACZ
PLB	23437/042	CONNECTOR MULTIWAY, PCB HEADER, 10 WAY, STRAIGHT, 2-ROW, 2.54mm GRID, TO ACCEPT LATCHING SOCKET,	BERG ELECTRONICS	75869-301
R1	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R2	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R3	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R4	25748/570	RESISTOR-VARIABLE CERMET LINEAR, 50K 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/503
R5	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R6	24811/133	RESISTOR-FIXED METAL-FILM 22R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22R1-1%50ppm
R7	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AR1	**10 MHz OCXO (contd.)**			
R8	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R9	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R10	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R11	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R12	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R13	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R14	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R15	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R16	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R17	24811/237	RESISTOR-FIXED METAL-FILM 475K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475K-1%50ppm
R23	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R24	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R25	24811/133	RESISTOR-FIXED METAL-FILM 22R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22R1-1%50ppm
R26	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R27	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R28	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R29	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R30	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R31	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R32	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R33	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R34	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R39	24811/195	RESISTOR-FIXED METAL-FILM 8K25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K25-1%50ppm
R40	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R49	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R50	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AR1	**10 MHz OCXO (contd.)**			
R51	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R52	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
SKA	23435/990	CONNECTOR SHORTING, SOCKET, 2 WAY, FOR 0.64mm SQ PINS, 2.54mm PITCH, 9.6mm HIGH, FREE MOUNTING,	BERG ELECTRONICS	65474-001
TR1	28431/767	TRANSISTOR PNP BIPOLAR MPS4258... 12V 700MHz 1W 80mA 30hFE @ 50mA, TO-92, (LOOSE).	NAT. SEMICONDUCTOR	PN4258
TR2	28459/050	TRANSISTOR N-CHANNEL-DEPLETION JFET 2N4856... 40V 360mW 50mA 25R TO-18.	TEMIC UK LTD	2N4856
XL1	28313/883	OSCILLATOR CRYSTAL, 10 MHz +/- 0.1 ppm, OCXO, 12V, 30mm LONG, 30mm WIDE, 26mm HIGH, 5 PIN, MODULE.	NDK CO LTD	END3032A

AR1/2 10 MHz OCXO

When ordering, prefix circuit reference with AR1/2.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44830/069	Complete unit	Issue 05	
C1	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C2	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C3	26386/871	CAPACITOR-FIXED CERAMIC 4.7nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-472-KP
C4 to C6	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C7	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C8	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C9	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C10	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C11	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C12	26451/015	CAPACITOR-FIXED ALUMINIUM 470uF +/-20% 10V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 10.3 x 10.3mm,	PANASONIC INDUSTRIAL	ECE-V-1A-A-471-P
C13	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C14	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C15	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C16	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C17	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C18	26386/871	CAPACITOR-FIXED CERAMIC 4.7nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-472-KP
C19	26451/001	CAPACITOR-FIXED ALUMINIUM 1uF +/-20% 50V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1HA-010R
C20	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C21 to C23	26451/009	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-470P
C24	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C25	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C26	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C27	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C28 to C31	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AR1/2 10 MHz OCXO (contd.)				
C32 to C34	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C35	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C36 to C39	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C40 to C42	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
D1	28383/934	DIODE SMALL-SIGNAL, LL4148... 500mW 50V 150mA 1Vf @ 10mA, SURFACE MOUNTED, MINI-MELF, (8mm TAPE -	PHILIPS	PMLL4148L
D2	28383/934	DIODE SMALL-SIGNAL, LL4148... 500mW 50V 150mA 1Vf @ 10mA, SURFACE MOUNTED, MINI-MELF, (8mm TAPE -	PHILIPS	PMLL4148L
D3	28371/494	DIODE VOLTAGE REFERENCE, 1N825... 250mW 6.2V 5% 50mA 20ppm/DEG.C, AXIAL, DO-7, (TAPED).	PHILIPS	1N825
D4	28349/029	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2810... 20V 1.2pF 410mVf @ 1mA, MARKNG CODE B0, LOW PROFILE,	HEWLETT-PACKARD	HSMS-2810-L31
D5 to D8	28383/934	DIODE SMALL-SIGNAL, LL4148... 500mW 50V 150mA 1Vf @ 10mA, SURFACE MOUNTED, MINI-MELF, (8mm TAPE -	PHILIPS	PMLL4148L
D9	28371/303	DIODE ZENER, BZX84-C6V2... 350mW 6.2V 5% 250mA MARKING CODE Z4, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C6V2
IC1	28467/110	IC-MICRO PERIPHERAL, PCF8574A... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 16 DEVICE ADDRESS	PHILIPS	PCF8574AT
IC2	28461/828	IC-ANALOGUE D/A-CONVERTER DAC-08... 8 BIT, HIGH SPEED MULTIPLYING, MONOLITHIC, 16 PIN,	NAT. SEMICONDUCTOR	DAC-0801LCM
IC3	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC4	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC5	28461/388	IC-ANALOGUE OPERATIONAL AMP LM324D... QUAD, GEN-PURPOSE, SLEW RATE 0.2V/uS MIN, GAIN BANDWIDTH	PHILIPS	LM324D
IC6	28466/390	IC-DIGITAL NAND-GATE 74HC00... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC00D
IC7	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC8	28469/543	IC-DIGITAL COUNTER 74HC390... 4 BIT, DUAL, DECADE RIPPLE, CMOS-H/SPEED, 16 PIN, SMALL-OUTLINE.	PHILIPS	74HC390D
IC9	28466/393	IC-DIGITAL NAND-GATE 74HC132... 2 INPUT, QUAD, SCHMITT TRIGGER, CMOS-H/SPEED, 14 PIN,	PHILIPS	74HC132D
IC10	28469/026	IC-DIGITAL INVERTER 74HCT04... HEX, CMOS-H/SPEED+TTL, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HCT04D
IC11	28461/412	IC-ANALOGUE OPERATIONAL AMP TL072... DUAL, 18V UNITY GAIN BNDWDTH 3MHz, OFFSET VOLTAGE 10mV, SLEW	MOTOROLA INC.	TL072CD
IC12	28469/026	IC-DIGITAL INVERTER 74HCT04... HEX, CMOS-H/SPEED+TTL, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HCT04D
IC13	28461/707	IC-ANALOGUE VOLTAGE-REGULATOR 7805... 5V 1A POSITIVE, LINEAR, MONOLITHIC, 3 PIN, TO-220.	NAT. SEMICONDUCTOR	uA7805UC

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AR1/2 10 MHz OCXO (contd.)				
PLB	23437/042	CONNECTOR MULTIWAY, PCB HEADER, 10 WAY, STRAIGHT, 2-ROW, 2.54mm GRID, TO ACCEPT LATCHING SOCKET,	BERG ELECTRONICS	75869-301
R1	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R2	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R3	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R4	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R5	24811/147	RESISTOR-FIXED METAL-FILM 82R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-82R5-1%50ppm
R6	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R7	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R8	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R9	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R10	24811/237	RESISTOR-FIXED METAL-FILM 475K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475K-1%50ppm
R11	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R12	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R13	24811/133	RESISTOR-FIXED METAL-FILM 22R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22R1-1%50ppm
R14	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R15	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R16	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R17	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R18	24811/133	RESISTOR-FIXED METAL-FILM 22R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22R1-1%50ppm
R19	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R20	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R21	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R22	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R23	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AR1/2 10 MHz OCXO (contd.)				
R24	24811/176	RESISTOR-FIXED METAL-FILM 1K3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K3-1%50ppm
R25	24811/176	RESISTOR-FIXED METAL-FILM 1K3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K3-1%50ppm
R26	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R27	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R28	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R29	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R30	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R31	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R32	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R33	24811/237	RESISTOR-FIXED METAL-FILM 475K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475K-1%50ppm
R34	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R35	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R36	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R37	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R38	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R39 to R41	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
TR1	28457/854	TRANSISTOR PNP BIPOLAR BFT93... 12V 5GHz 200mW 35mA MARKING CODE X1, SURFACE MOUNTED, SOT-23,	PHILIPS	BFT93
TR2	28459/061	TRANSISTOR N-CHANNEL-DEPLETION JFET BSR56... 40V 250mW 50mA MARKING CODE M4, SURFACE MOUNTED,	PHILIPS	BSR56
XL1	28313/883	OSCILLATOR CRYSTAL, 10 MHz +/- 0.1 ppm, OCXO, 12V, 30mm LONG, 30mm WIDE, 26mm HIGH, 5 PIN, MODULE.	NDK CO LTD	END3032A

AR2 PSU distribution

When ordering, prefix circuit reference with AR2.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829-828	Complete unit	Issue 05	
C1	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C2	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C3	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C4	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C5	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
D1	28371/735	DIODE ZENER, BZX84-C8V2... 350mW 8.2V 5% 250mA MARKING CODE Z7, SURFACE MOUNTED, SOT-23, (TAPED).	PHILIPS	BZX84-C8V2
D2	28371/303	DIODE ZENER, BZX84-C6V2... 350mW 6.2V 5% 250mA MARKING CODE Z4, SURFACE MOUNTED, SOT-23, (TAPED).	PHILIPS	BZX84-C6V2
L1	23642/909	WOUND-PART INDUCTOR, WIDEBAND HF CHOKE, BEAD-CORE, 4B1 GRADE MATERIAL, 2.5 TURNS, TINNED COPPER WIRE.	PHILIPS	4312-020-36700
L2	23642/909	WOUND-PART INDUCTOR, WIDEBAND HF CHOKE, BEAD-CORE, 4B1 GRADE MATERIAL, 2.5 TURNS, TINNED COPPER WIRE.	PHILIPS	4312-020-36700
L3	23642/909	WOUND-PART INDUCTOR, WIDEBAND HF CHOKE, BEAD-CORE, 4B1 GRADE MATERIAL, 2.5 TURNS, TINNED COPPER WIRE.	PHILIPS	4312-020-36700
L4	23642/909	WOUND-PART INDUCTOR, WIDEBAND HF CHOKE, BEAD-CORE, 4B1 GRADE MATERIAL, 2.5 TURNS, TINNED COPPER WIRE.	PHILIPS	4312-020-36700
L5	23642/909	WOUND-PART INDUCTOR, WIDEBAND HF CHOKE, BEAD-CORE, 4B1 GRADE MATERIAL, 2.5 TURNS, TINNED COPPER WIRE.	PHILIPS	4312-020-36700
PLA	23436/795	CONNECTOR MULTIWAY, PCB HEADER, 14 WAY, STRAIGHT, 3.96mm PITCH, WITHOUT LOCK, TIN PLATED PINS,	MOLEX ELECTRONICS	26-48-1141
PLB	23436/794	CONNECTOR MULTIWAY, PCB HEADER, 2 WAY, STRAIGHT, 3.96mm PITCH, WITHOUT LOCK, TIN PLATED PINS,	MOLEX ELECTRONICS	26-48-1021
PLC	23435/950	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7208
PLD	23436/777	CONNECTOR MULTIWAY, PCB HEADER, 6 WAY, RIGHT ANGLED, 3.96mm PITCH, WITH FRICTION LOCK, GOLD	MOLEX ELECTRONICS	26-48-2066
PLE	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLF	23435/112	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-107-36
	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLG	23435/112	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-107-36
	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AR2	**PSU distribution (contd.)**			
R1	24811/182	RESISTOR-FIXED METAL-FILM 2K43 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K43-1%50ppm
R2	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R3	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R4	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
TR1	28455/302	TRANSISTOR NPN BIPOLAR BCX54... 45V 130MHz 1W 1A 40hFE MIN @ 150mA, MARKING CODE BA/BB/BC/BD,	PHILIPS	BCX54
TR2	28433/828	TRANSISTOR PNP BIPOLAR BC858B... 30V 150MHz 200mW 100mA 220hFE MIN @ 2mA, MARKING CODE 3K, SURFACE	PHILIPS	BC858B

A1 Audio generator

When ordering, prefix circuit reference with A1.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829-831	Complete unit	Issue 13	
C1	26386/828	CAPACITOR-FIXED CERAMIC 220pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-221-JP
C2	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C3	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C4	26421/106	CAPACITOR-FIXED ALUMINIUM 1uF +/-20% 50V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1H-KA-010-B
C5	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C6	26421/106	CAPACITOR-FIXED ALUMINIUM 1uF +/-20% 50V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1H-KA-010-B
C7	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C8	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C9	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C10 to C12	26538/635	CAPACITOR-FIXED POLYSTYRENE 470pF +/-2% 63V 150 ppm/DEG.C, RADIAL, 7.6mm PWP, (TAPED).	LCR COMPONENTS	EP9-470pF-2%-63V
C13	26538/603	CAPACITOR-FIXED POLYSTYRENE 330pF +/-2% 63V 150 ppm/DEG.C, RADIAL, 7.6mm PWP, (TAPED).	LCR COMPONENTS	EP9-330pF-2%-63V
C14	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C15	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C16	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C17	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C18	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C19	26383/592	CAPACITOR-FIXED CERAMIC 1.2nF +/-10% 63V 2C2 SINGLELAYER, RADIAL, 2.5mm PWP, (TAPED).	PHILIPS	2222-630-51122
C20	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C21	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C22	26383/592	CAPACITOR-FIXED CERAMIC 1.2nF +/-10% 63V 2C2 SINGLELAYER, RADIAL, 2.5mm PWP, (TAPED).	PHILIPS	2222-630-51122
C23	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C24	26538/902	CAPACITOR-FIXED POLYSTYRENE 1nF +/-1% 63V 125 ppm/DEG.C, RADIAL, 5.08mm PWP, SQUARE, WIRES ON	PHILIPS	2222-443-81002
C25	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP

A1 Audio generator (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
C26	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C27	26538/618	CAPACITOR-FIXED POLYSTYRENE 300pF +/-2% 63V 150 ppm/DEG.C, RADIAL, 7.6mm PWP, (TAPED).	LCR COMPONENTS	EP9-300pF-2%-63V
C28	26538/902	CAPACITOR-FIXED POLYSTYRENE 1nF +/-1% 63V 125 ppm/DEG.C, RADIAL, 5.08mm PWP, SQUARE, WIRES ON	PHILIPS	2222-443-81002
C29	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C30	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C31	26538/618	CAPACITOR-FIXED POLYSTYRENE 300pF +/-2% 63V 150 ppm/DEG.C, RADIAL, 7.6mm PWP, (TAPED).	LCR COMPONENTS	EP9-300pF-2%-63V
C32	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C33	26386/825	CAPACITOR-FIXED CERAMIC 120pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-121-JP
C34	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C35	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C36	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C37	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C38	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C39	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C40	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C41	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C42	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C43	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C44	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C45	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C46	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C47	26386/814	CAPACITOR-FIXED CERAMIC 15pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-150-JP
C48	26386/814	CAPACITOR-FIXED CERAMIC 15pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-150-JP
C49	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C50	26386/871	CAPACITOR-FIXED CERAMIC 4.7nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-472-KP
C51	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1 Audio generator (contd.)				
C52	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C53	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C54	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C55	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C56	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C57	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C58	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C59	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C61	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C62	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C63	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C64	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C65 to C88	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C89	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C91	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C92	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C93 to C141	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C142 to C144	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C145	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C146	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C150	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C151	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C152	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
D1	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1	**Audio generator (contd.)**			
D2	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D3	28372/781	DIODE ZENER, BZX84-C18... 350mW 18V 5% 250mA MARKING CODE Y6, SURFACE MOUNTED, SOT-23, (TAPED).	PHILIPS	BZX84-C18
D4	28372/781	DIODE ZENER, BZX84-C18... 350mW 18V 5% 250mA MARKING CODE Y6, SURFACE MOUNTED, SOT-23, (TAPED).	PHILIPS	BZX84-C18
D5	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D6	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D7	28372/781	DIODE ZENER, BZX84-C18... 350mW 18V 5% 250mA MARKING CODE Y6, SURFACE MOUNTED, SOT-23, (TAPED).	PHILIPS	BZX84-C18
D8	28372/781	DIODE ZENER, BZX84-C18... 350mW 18V 5% 250mA MARKING CODE Y6, SURFACE MOUNTED, SOT-23, (TAPED).	PHILIPS	BZX84-C18
D9	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D10	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D11	28372/032	DIODE ZENER, BZX84-C10... 350mW 10V 5% 250mA MARKING CODE Z9, SURFACE MOUNTED, SOT-23, (TAPED).	PHILIPS	BZX84-C10
D12	28372/032	DIODE ZENER, BZX84-C10... 350mW 10V 5% 250mA MARKING CODE Z9, SURFACE MOUNTED, SOT-23, (TAPED).	PHILIPS	BZX84-C10
D13	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D14	28357/028	DIODE RECTIFIER, 1N4004... 400V 1A 1.1Vf @ 1A, AXIAL, SOD-81, (TAPED).	PHILIPS	1N4004
D15	28357/028	DIODE RECTIFIER, 1N4004... 400V 1A 1.1Vf @ 1A, AXIAL, SOD-81, (TAPED).	PHILIPS	1N4004
D16	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
IC1	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC2	28466/120	IC-DIGITAL OR-GATE 74HC32... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC32D
IC3	28467/161	IC-MICRO CONTROLLER, 80C652... 8 BIT, 16MHz, 256 BYTE RAM, I.IC BUS, DUPLEX UART, 4 x 8 BIT I/O	PHILIPS	P80C652FBA
IC4	28469/058	IC-DIGITAL BUFFER/LINE-DRIVER 74HC244... 4 INPUT, 4 BIT, DUAL, NON-INVERTING, TRI-STATE BUS,	PHILIPS	74HC244D
IC5	28466/032	IC-DIGITAL AND-GATE 74HC08... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC08D
IC6	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC7	28469/049	IC-DIGITAL TRANSCEIVER 74HCT245... OCTAL, BI-DIRECTIONAL, TRI-STATE BUS, CMOS-H/SPEED+TTL,	PHILIPS	74HCT245D
IC8	28462/438	IC-DIGITAL LATCH 74HC373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC373D
IC9	28469/058	IC-DIGITAL BUFFER/LINE-DRIVER 74HC244... 4 INPUT, 4 BIT, DUAL, NON-INVERTING, TRI-STATE BUS,	PHILIPS	74HC244D

A1 Audio generator (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
IC11	28467/118	IC-MICRO STATIC-RAM, 32K x 8 BIT, 62256... 100nS, 100uA STANDBY CURRENT, 0.45in PITCH, CMOS, 28 PIN,	TOSHIBA (UK) LTD	TC55257BFL-10
IC12	28465/055	IC-DIGITAL DECODER/DEMULTIPLEX 74HC138... 3 INPUT, 8 BIT, SINGLE, INVERTING, 3 BIT ADDRESS,	PHILIPS	74HC138D
IC13	28465/055	IC-DIGITAL DECODER/DEMULTIPLEX 74HC138... 3 INPUT, 8 BIT, SINGLE, INVERTING, 3 BIT ADDRESS,	PHILIPS	74HC138D
IC14	28466/120	IC-DIGITAL OR-GATE 74HC32... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC32D
IC15	28466/120	IC-DIGITAL OR-GATE 74HC32... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC32D
IC16	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC17	28462/431	IC-DIGITAL LATCH 74HCT373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED+TTL, 20 PIN,	PHILIPS	74HCT373D
IC18	28462/431	IC-DIGITAL LATCH 74HCT373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED+TTL, 20 PIN,	PHILIPS	74HCT373D
IC19	28469/058	IC-DIGITAL BUFFER/LINE-DRIVER 74HC244... 4 INPUT, 4 BIT, DUAL, NON-INVERTING, TRI-STATE BUS,	PHILIPS	74HC244D
IC20	28462/438	IC-DIGITAL LATCH 74HC373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC373D
IC21	28466/120	IC-DIGITAL OR-GATE 74HC32... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC32D
IC22	28466/032	IC-DIGITAL AND-GATE 74HC08... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC08D
IC23	28469/058	IC-DIGITAL BUFFER/LINE-DRIVER 74HC244... 4 INPUT, 4 BIT, DUAL, NON-INVERTING, TRI-STATE BUS,	PHILIPS	74HC244D
IC24	28469/058	IC-DIGITAL BUFFER/LINE-DRIVER 74HC244... 4 INPUT, 4 BIT, DUAL, NON-INVERTING, TRI-STATE BUS,	PHILIPS	74HC244D
IC25	28469/051	IC-DIGITAL INVERTER 74AC04... HEX, CMOS-ADVANCED, 14 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	74AC04SC
IC26	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC27	28466/241	IC-DIGITAL NOR-GATE 74HC02... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC02D
IC28	28461/736	IC-ANALOGUE VOLTAGE-REGULATOR 79L05AC... 5V 100mA NEGATIVE, OUTPUT VOLTAGE ERROR <5% OVERLOAD,	NAT. SEMICONDUCTOR	LM79L05ACZ
IC30	28467/108	IC-MICRO DIGIT/SGNL PROCESSR, ADSP2105... 10MHz DIGITAL SIGNAL PROCESSING, 1K PROGRAM & 0.5K DATA	ANALOG DEVICES LTD	ADSP2105KP-40
IC31	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC32	28465/055	IC-DIGITAL DECODER/DEMULTIPLEX 74HC138... 3 INPUT, 8 BIT, SINGLE, INVERTING, 3 BIT ADDRESS,	PHILIPS	74HC138D
IC33	28466/120	IC-DIGITAL OR-GATE 74HC32... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC32D
IC34	28462/157	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC377... OCTAL, POS EDGE TRIGGER WITH DATA ENABLE, CMOS-H/SPEED, 20	PHILIPS	74HC377D
IC35	28462/157	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC377... OCTAL, POS EDGE TRIGGER WITH DATA ENABLE, CMOS-H/SPEED, 20	PHILIPS	74HC377D
IC36	28469/058	IC-DIGITAL BUFFER/LINE-DRIVER 74HC244... 4 INPUT, 4 BIT, DUAL, NON-INVERTING, TRI-STATE BUS,	PHILIPS	74HC244D
IC37	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D

A1 Audio generator (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
IC38	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC39	28469/546	IC-DIGITAL FILTER DF1700... 16 INPUT, SINGLE, 8 x OVER SAMPLING, STOPBAND ATTEN >110dB, USER SELECT	BURR-BROWN INTERNAT	DF1700P
IC40	28461/804	IC-ANALOGUE D/A-CONVERTER DAC-312... SINGLE, 12 BIT, HIGH SPEED MULTIPLYING, BIPOLAR, 20 PIN,	ANALOG DEVICES LTD	DAC-312HS
IC41	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC42	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC43	28461/803	IC-ANALOGUE VOLTAGE-REFERENCE LT1019... 5V PRECISION, OUTPUT VOLTAGE DRIFT 20ppm/DEG.C MAX,	LINEAR TECHNOLOGY	LT1019CS8-5
IC44	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC45	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC46	28461/734	IC-ANALOGUE VOLTAGE-REGULATOR 78L05AC... 5V 100mA POSITIVE, LINEAR, 5% REGULATION, MONOLITHIC, 3	NAT. SEMICONDUCTOR	LM78L05ACZ
IC47	28461/805	IC-ANALOGUE D/A-CONVERTER AD1865... DUAL, 5V 18 BIT, AUDIO, SERIAL INPUT, CO-PHASED OUTPUT, 116dB	ANALOG DEVICES LTD	AD1865N
IC48	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC49	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC50	28461/874	IC-ANALOGUE SWITCH DG411... QUAD, 15V SPST, ON-RESISTANCE<35R, 4 x N/O @ LOGIC 1, TTL	SILICONIX LTD	DG411DY
IC51	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC52	28469/759	IC-ANALOGUE MULTIPLEXER DG508A... 8 INPUT, SINGLE, 15V & -15V, CMOS, 16 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	MUX-08FS
IC53	28469/053	IC-ANALOGUE BUFFER-AMPLIFIER EL2001... 18V UNITY GAIN, SLEW-RATE 1200 V/uS MIN, BANDWIDTH 70MHz @	ELANTEC INC	EL2001CN
IC54	28461/874	IC-ANALOGUE SWITCH DG411... QUAD, 15V SPST, ON-RESISTANCE<35R, 4 x N/O @ LOGIC 1, TTL	SILICONIX LTD	DG411DY
IC55	28461/874	IC-ANALOGUE SWITCH DG411... QUAD, 15V SPST, ON-RESISTANCE<35R, 4 x N/O @ LOGIC 1, TTL	SILICONIX LTD	DG411DY
IC56	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC57	28461/977	IC-ANALOGUE D/A-CONVERTER AD7537... DUAL, 15V 12 BIT, 8+4 LOADING, REL-ACC +/-1 LSB, GAIN-ERR +/-6	ANALOG DEVICES LTD	AD7537JN
IC58	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC59	28469/759	IC-ANALOGUE MULTIPLEXER DG508A... 8 INPUT, SINGLE, 15V & -15V, CMOS, 16 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	MUX-08FS
IC60	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC61	28461/874	IC-ANALOGUE SWITCH DG411... QUAD, 15V SPST, ON-RESISTANCE<35R, 4 x N/O @ LOGIC 1, TTL	SILICONIX LTD	DG411DY
IC62	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC63	28461/874	IC-ANALOGUE SWITCH DG411... QUAD, 15V SPST, ON-RESISTANCE<35R, 4 x N/O @ LOGIC 1, TTL	SILICONIX LTD	DG411DY

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1 Audio generator (contd.)				
IC64	28466/120	IC-DIGITAL OR-GATE 74HC32... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC32D
IC65	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC66	44535/236	IC-PROGRAMMED PAL, SET OF 1, 2965, AUDIO COUNTER LOGIC.	MARCONI INSTRUMENTS LTD	
IC67	28467/101	IC-MICRO CONTROLLER, 82C54... PROGRAMMABLE INTERVAL TIMER, 8MHz, CMOS, 28 PIN, PLCC.	HARRIS SEMICONDUCTOR	CS82C54
IC68	28462/152	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC273... 8 INPUT, 8 BIT, OCTAL, WITH RESET, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC273D
IC69	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC70	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC71	28462/152	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC273... 8 INPUT, 8 BIT, OCTAL, WITH RESET, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC273D
IC72	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC73	28462/152	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC273... 8 INPUT, 8 BIT, OCTAL, WITH RESET, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC273D
IC74	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
L1 to L4	23642/555	INDUCTOR-FIXED 10uH +/- 10% COATED-LACQUER, MINIATURE, 470mA 0R9 MAX, 45 Q @ 7.9 MHz, 45 MHz	MEGGITT ELECTRONICS	C11-406/8/27520/006
PLA	23436/901	CONNECTOR MULTIWAY, PCB HEADER, 16 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	THOMAS & BETTS LTD	609-1607
PLB to PLF	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
R1	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R2	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R3	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R4	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R5	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R6	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R7	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R8	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm

A1 Audio generator (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R9	24811/182	RESISTOR-FIXED METAL-FILM 2K43 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K43-1%50ppm
R10	24811/182	RESISTOR-FIXED METAL-FILM 2K43 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K43-1%50ppm
R11	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R12	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R13	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R14	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R15	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R16	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R17	24811/184	RESISTOR-FIXED METAL-FILM 3K01 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K01-1%50ppm
R18	24811/186	RESISTOR-FIXED METAL-FILM 3K65 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K65-1%50ppm
R19	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R20	24811/188	RESISTOR-FIXED METAL-FILM 4K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K32-1%50ppm
R21	24811/192	RESISTOR-FIXED METAL-FILM 6K19 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K19-1%50ppm
R22 to R27	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R28	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R29	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R30	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R31	24811/203	RESISTOR-FIXED METAL-FILM 18K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-18K2-1%50ppm
R32	24811/209	RESISTOR-FIXED METAL-FILM 33K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-1%50ppm
R33	24811/612	RESISTOR-FIXED METAL-FILM 80K6 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-80K6-0.1%-15
R34	24811/612	RESISTOR-FIXED METAL-FILM 80K6 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-80K6-0.1%-15
R35	24811/611	RESISTOR-FIXED METAL-FILM 9K09 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-9K09-0.1%-15
R36	24811/610	RESISTOR-FIXED METAL-FILM 909R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-909R-0.1%-15
R37	24811/609	RESISTOR-FIXED METAL-FILM 90R9 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-90R9-0.1%-15
R38	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R39	24811/215	RESISTOR-FIXED METAL-FILM 56K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56K2-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1 Audio generator (contd.)				
R40	24811/215	RESISTOR-FIXED METAL-FILM 56K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56K2-1%50ppm
R41	24573/089	RESISTOR-FIXED METAL-OXIDE 4K7 +/- 2% 500mW 350V 250 ppm/DEG.C, AXIAL, (LOOSE OR TAPED).	VISHAY COMPONENTS	TR5-4K7-2%
R42	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R43	24811/215	RESISTOR-FIXED METAL-FILM 56K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56K2-1%50ppm
R44	24811/215	RESISTOR-FIXED METAL-FILM 56K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56K2-1%50ppm
R45	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R46	24573/089	RESISTOR-FIXED METAL-OXIDE 4K7 +/- 2% 500mW 350V 250 ppm/DEG.C, AXIAL, (LOOSE OR TAPED).	VISHAY COMPONENTS	TR5-4K7-2%
R47	24573/097	RESISTOR-FIXED METAL-OXIDE 10K +/- 2% 500mW 350V 250 ppm/DEG.C, AXIAL, (LOOSE OR TAPED).	VISHAY COMPONENTS	TR5-10K-2%
R48	24573/097	RESISTOR-FIXED METAL-OXIDE 10K +/- 2% 500mW 350V 250 ppm/DEG.C, AXIAL, (LOOSE OR TAPED).	VISHAY COMPONENTS	TR5-10K-2%
R49 to R54	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R55	24811/200	RESISTOR-FIXED METAL-FILM 13K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-13K-1%50ppm
R56	24811/207	RESISTOR-FIXED METAL-FILM 27K4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27K4-1%50ppm
R57	24811/195	RESISTOR-FIXED METAL-FILM 8K25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K25-1%50ppm
R58	24811/200	RESISTOR-FIXED METAL-FILM 13K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-13K-1%50ppm
R59	24811/204	RESISTOR-FIXED METAL-FILM 20K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20K-1%50ppm
R60	24811/200	RESISTOR-FIXED METAL-FILM 13K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-13K-1%50ppm
R61	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R62 to R65	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R66	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R67	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R68	24811/207	RESISTOR-FIXED METAL-FILM 27K4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27K4-1%50ppm
R69	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R70	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R71 to R73	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R74	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R75	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm

A1 Audio generator (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R76	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R77	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R78	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R79	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R80 to R84	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R85	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R86	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R87	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R88	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R89	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R90 to R93	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R94	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R95	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R96	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R98 to R100	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R101 to R104	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R105	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R106 to R108	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R109	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R110	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R111	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R112	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R113	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R114 to R118	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R119	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R120	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1 Audio generator (contd.)				
R121	24681/672	RESISTOR-NETWORK BUSSED, THICK-FILM, 15K 2% 1W 50V 100 ppm/DEG.C, 9 RESISTORS, LOW PROFILE, 10 PIN,	VISHAY COMPONENTS	LC0-001-1502G
R122	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R124	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R126	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R128	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R129	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50	VISHAY COMPONENTS	
TR1	28487/810	TRANSISTOR NPN BIPOLAR BSV52... 12V 400MHz 250mW 100mA MARKING CODE B2, SURFACE MOUNTED, SOT-23,	PHILIPS	BSV-52
TR2	28459/045	TRANSISTOR N-CHANNEL-ENHANCE MOSFET IRFD110... 60V 1W 1A 0R6 4 PIN, DUAL-IN-LINE.	INTERNAT RECTIFIER	IRFD110
TR3	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR4	28459/063	TRANSISTOR P-CHANNEL-ENHANCE MOSFET BST100... 60V 1W 300mA 4R5 TO-92, (LOOSE).	PHILIPS	BST100
TR5	28457/852	TRANSISTOR PNP BIPOLAR BSR15... 60V 200MHz 300mW 600mA MARKING CODE CH/T7p, SURFACE MOUNTED,	PHILIPS	BSR15

A1/2 Audio generator

When ordering, prefix circuit reference with A1/2.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44830-043	Complete unit	Issue 04	
C1	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C2	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C3	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C4	26451/009	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-470P
C5	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C6	26451/009	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-470P
C7	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C8	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C9	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C10 to C12	26386/931	CAPACITOR-FIXED CERAMIC 470pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-471-FAT-1A
C13	26386/783	CAPACITOR-FIXED CERAMIC 330pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-331-FAT-1A
C14	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C15	26451/004	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	RUBYCON CAPACITORS	35-REV-10
C16	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C17	26585/001	CAPACITOR-FIXED POLYESTER 1uF +/-10% 63V SURFACE-MOUNTED, SIZE 7.3 x 10mm, 4.5mm HIGH NOM,	WIMA CAPACITORS LTD	SMD7.3-1uF10%-63V-TR
C18	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C19	26386/933	CAPACITOR-FIXED CERAMIC 1.2nF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	AVX LTD	1206-5A-122-FAT-1A
C20	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C21	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C22	26386/933	CAPACITOR-FIXED CERAMIC 1.2nF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	AVX LTD	1206-5A-122-FAT-1A
C24	26386/932	CAPACITOR-FIXED CERAMIC 1nF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	AVX LTD	1206-5A-102-FAT-1A
C25	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C26	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C27	26386/782	CAPACITOR-FIXED CERAMIC 120pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-121-FAT-1A

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1/2	**Audio generator (contd.)**			
C28	26386/932	CAPACITOR-FIXED CERAMIC 1nF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	AVX LTD	1206-5A-102-FAT-1A
C29	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C30	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C31	26386/782	CAPACITOR-FIXED CERAMIC 120pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-121-FAT-1A
C32	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C33	26386/829	CAPACITOR-FIXED CERAMIC 270pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-271-JP
C34	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C35	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C36	26451/004	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	RUBYCON CAPACITORS	35-REV-10
C37	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C38	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C39	26451/004	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	RUBYCON CAPACITORS	35-REV-10
C40	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C41	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C42	26451/004	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	RUBYCON CAPACITORS	35-REV-10
C43	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C44	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C45	26451/004	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	RUBYCON CAPACITORS	35-REV-10
C46	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C47	26386/814	CAPACITOR-FIXED CERAMIC 15pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-150-JP
C48	26386/814	CAPACITOR-FIXED CERAMIC 15pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-150-JP
C49	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C50	26386/871	CAPACITOR-FIXED CERAMIC 4.7nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-472-KP
C51	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C54	26451/010	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-101P
C55	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1/2	**Audio generator (contd.)**			
C56	26451/009	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-470P
C57	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C58	26451/009	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-470P
C59	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C61	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C62	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C63	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C64	26451/010	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-101P
C65 to C88	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C89	26585/001	CAPACITOR-FIXED POLYESTER 1uF +/-10% 63V SURFACE-MOUNTED, SIZE 7.3 x 10mm, 4.5mm HIGH NOM,	WIMA CAPACITORS LTD	SMD7.3-1uF10%-63V-TR
C91	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C92	26451/010	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-101P
C93 to C141	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C142 to C144	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C145 to C147	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C150	26585/001	CAPACITOR-FIXED POLYESTER 1uF +/-10% 63V SURFACE-MOUNTED, SIZE 7.3 x 10mm, 4.5mm HIGH NOM,	WIMA CAPACITORS LTD	SMD7.3-1uF10%-63V-TR
C151	26585/001	CAPACITOR-FIXED POLYESTER 1uF +/-10% 63V SURFACE-MOUNTED, SIZE 7.3 x 10mm, 4.5mm HIGH NOM,	WIMA CAPACITORS LTD	SMD7.3-1uF10%-63V-TR
C152	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C160	26386/930	CAPACITOR-FIXED CERAMIC 180pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-181-FAT-1A
C161	26386/930	CAPACITOR-FIXED CERAMIC 180pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-181-FAT-1A
D1	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D2	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D3	28372/781	DIODE ZENER, BZX84-C18... 350mW 18V 5% 250mA MARKING CODE Y6, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C18
D4	28372/781	DIODE ZENER, BZX84-C18... 350mW 18V 5% 250mA MARKING CODE Y6, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C18

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1/2	**Audio generator (contd.)**			
D5	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D6	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D7	28372/781	DIODE ZENER, BZX84-C18... 350mW 18V 5% 250mA MARKING CODE Y6, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C18
D8	28372/781	DIODE ZENER, BZX84-C18... 350mW 18V 5% 250mA MARKING CODE Y6, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C18
D9	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D10	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D11	28372/032	DIODE ZENER, BZX84-C10... 350mW 10V 5% 250mA MARKING CODE Z9, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C10
D12	28372/032	DIODE ZENER, BZX84-C10... 350mW 10V 5% 250mA MARKING CODE Z9, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C10
D13	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D14	28383/934	DIODE SMALL-SIGNAL, LL4148... 500mW 50V 150mA 1Vf @ 10mA, SURFACE MOUNTED, MINI-MELF, (8mm TAPE -	PHILIPS	PMLL4148L
D15	28383/934	DIODE SMALL-SIGNAL, LL4148... 500mW 50V 150mA 1Vf @ 10mA, SURFACE MOUNTED, MINI-MELF, (8mm TAPE -	PHILIPS	PMLL4148L
D16	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
FL1	23642/801	FILTER RFI-SUPPRESSION, 3A RATING, SURFACE MOUNT, MULTILAYER IMPEDER, 95R IMPEDANCE @ 10MHz, 0.04R	HF50ACC-575032-T	TDK UK LTD
IC1	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC2	28466/120	IC-DIGITAL OR-GATE 74HC32... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC32D
IC3	28467/161	IC-MICRO CONTROLLER, 80C652... 8 BIT, 16MHz, 256 BYTE RAM, I.IC BUS, DUPLEX UART, 4 x 8 BIT I/O	PHILIPS	P80C652FBA
IC4	28469/058	IC-DIGITAL BUFFER/LINE-DRIVER 74HC244... 4 INPUT, 4 BIT, DUAL, NON-INVERTING, TRI-STATE BUS,	PHILIPS	74HC244D
IC5	28466/032	IC-DIGITAL AND-GATE 74HC08... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC08D
IC6	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC7	28469/049	IC-DIGITAL TRANSCEIVER 74HCT245... OCTAL, BI-DIRECTIONAL, TRI-STATE BUS, CMOS-H/SPEED+TTL,	PHILIPS	74HCT245D
IC8	28462/438	IC-DIGITAL LATCH 74HC373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC373D
IC9	28469/058	IC-DIGITAL BUFFER/LINE-DRIVER 74HC244... 4 INPUT, 4 BIT, DUAL, NON-INVERTING, TRI-STATE BUS,	PHILIPS	74HC244D
IC11	28467/118	IC-MICRO STATIC-RAM, 32K x 8 BIT, 62256... 100nS, 100uA STANDBY CURRENT, 0.45in PITCH, CMOS, 28 PIN,	TOSHIBA (UK) LTD	TC55257BFL-10

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1/2	**Audio generator (contd.)**			
IC12	28465/055	IC-DIGITAL DECODER/DEMULTIPLEX 74HC138... 3 INPUT, 8 BIT, SINGLE, INVERTING, 3 BIT ADDRESS,	PHILIPS	74HC138D
IC13	28465/055	IC-DIGITAL DECODER/DEMULTIPLEX 74HC138... 3 INPUT, 8 BIT, SINGLE, INVERTING, 3 BIT ADDRESS,	PHILIPS	74HC138D
IC14	28466/120	IC-DIGITAL OR-GATE 74HC32... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC32D
IC15	28466/120	IC-DIGITAL OR-GATE 74HC32... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC32D
IC16	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC17	28462/431	IC-DIGITAL LATCH 74HCT373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED+TTL, 20 PIN,	PHILIPS	74HCT373D
IC18	28462/431	IC-DIGITAL LATCH 74HCT373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED+TTL, 20 PIN,	PHILIPS	74HCT373D
IC19	28469/058	IC-DIGITAL BUFFER/LINE-DRIVER 74HC244... 4 INPUT, 4 BIT, DUAL, NON-INVERTING, TRI-STATE BUS,	PHILIPS	74HC244D
IC20	28462/438	IC-DIGITAL LATCH 74HC373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC373D
IC21	28466/120	IC-DIGITAL OR-GATE 74HC32... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC32D
IC22	28466/032	IC-DIGITAL AND-GATE 74HC08... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC08D
IC23	28469/058	IC-DIGITAL BUFFER/LINE-DRIVER 74HC244... 4 INPUT, 4 BIT, DUAL, NON-INVERTING, TRI-STATE BUS,	PHILIPS	74HC244D
IC24	28469/058	IC-DIGITAL BUFFER/LINE-DRIVER 74HC244... 4 INPUT, 4 BIT, DUAL, NON-INVERTING, TRI-STATE BUS,	PHILIPS	74HC244D
IC25	28469/051	IC-DIGITAL INVERTER 74AC04... HEX, CMOS-ADVANCED, 14 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	74AC04SC
IC26	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC27	28466/241	IC-DIGITAL NOR-GATE 74HC02... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC02D
IC28	28461/780	IC-ANALOGUE VOLTAGE-REGULATOR 79L05AC... 5V 100mA NEGATIVE, LINEAR, 5% REGULATION, MONOLITHIC, 8	NAT. SEMICONDUCTOR	LM79L05ACM
IC30	28467/108	IC-MICRO DIGIT/SGNL PROCESSR, ADSP2105... 10MHz DIGITAL SIGNAL PROCESSING, 1K PROGRAM & 0.5K DATA	ANALOG DEVICES LTD	ADSP2105KP-40
IC31	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC32	28465/055	IC-DIGITAL DECODER/DEMULTIPLEX 74HC138... 3 INPUT, 8 BIT, SINGLE, INVERTING, 3 BIT ADDRESS,	PHILIPS	74HC138D
IC33	28466/120	IC-DIGITAL OR-GATE 74HC32... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC32D
IC34	28462/157	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC377... OCTAL, POS EDGE TRIGGER WITH DATA ENABLE, CMOS-H/SPEED, 20	PHILIPS	74HC377D
IC35	28462/157	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC377... OCTAL, POS EDGE TRIGGER WITH DATA ENABLE, CMOS-H/SPEED, 20	PHILIPS	74HC377D
IC36	28469/058	IC-DIGITAL BUFFER/LINE-DRIVER 74HC244... 4 INPUT, 4 BIT, DUAL, NON-INVERTING, TRI-STATE BUS,	PHILIPS	74HC244D
IC37	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC38	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1/2	**Audio generator (contd.)**			
IC39	28469/576	IC-DIGITAL FILTER DF1700... 16 INPUT, SINGLE, 8 x OVER SAMPLING, STOPBAND ATTEN >110dB, USER SELECT	BURR-BROWN INTERNAT	DF1700U
IC40	28461/804	IC-ANALOGUE D/A-CONVERTER DAC-312... SINGLE, 12 BIT, HIGH SPEED MULTIPLYING, BIPOLAR, 20 PIN,	ANALOG DEVICES LTD	DAC-312HS
IC41	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC42	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC43	28461/803	IC-ANALOGUE VOLTAGE-REFERENCE LT1019... 5V PRECISION, OUTPUT VOLTAGE DRIFT 20ppm/DEG.C MAX,	LINEAR TECHNOLOGY	LT1019CS8-5
IC44	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC45	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC46	28461/774	IC-ANALOGUE VOLTAGE-REGULATOR 78L05AC... 5V +/-5%, POSITIVE, LINEAR, BIPOLAR, 8 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	LM78L05ACM
IC47	28461/847	IC-ANALOGUE D/A-CONVERTER AD1865... DUAL, 5V 18 BIT, AUDIO, SERIAL INPUT, CO-PHASED OUTPUT, 116dB	ANALOG DEVICES LTD	AD1865R
IC48	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC49	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC50	28461/874	IC-ANALOGUE SWITCH DG411... QUAD, 15V SPST, ON-RESISTANCE<35R, 4 x N/O @ LOGIC 1, TTL	ANALOG DEVICES LTD	ADG411BR
IC51	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC52	28469/759	IC-ANALOGUE MULTIPLEXER DG508A... 8 INPUT, SINGLE, 15V & -15V, CMOS, 16 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	MUX-08FS
IC53	28461/514	IC-ANALOGUE BUFFER-AMPLIFIER EL2001... 18V UNITY GAIN, SLEW-RATE 1200 V/uS MIN, BANDWIDTH 70MHz @	ELANTEC INC	EL2001CM
IC54	28461/874	IC-ANALOGUE SWITCH DG411... QUAD, 15V SPST, ON-RESISTANCE<35R, 4 x N/O @ LOGIC 1, TTL	ANALOG DEVICES LTD	ADG411BR
IC55	28461/874	IC-ANALOGUE SWITCH DG411... QUAD, 15V SPST, ON-RESISTANCE<35R, 4 x N/O @ LOGIC 1, TTL	ANALOG DEVICES LTD	ADG411BR
IC56	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC57	28461/037	IC-ANALOGUE D/A-CONVERTER AD7537... DUAL, 15V 12 BIT, 8+4 LOADING, REL-ACC +/-1 LSB, GAIN-ERR +/-6	ANALOG DEVICES LTD	AD7537JP
IC58	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC59	28469/759	IC-ANALOGUE MULTIPLEXER DG508A... 8 INPUT, SINGLE, 15V & -15V, CMOS, 16 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	MUX-08FS
IC60	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC61	28461/874	IC-ANALOGUE SWITCH DG411... QUAD, 15V SPST, ON-RESISTANCE<35R, 4 x N/O @ LOGIC 1, TTL	ANALOG DEVICES LTD	ADG411BR
IC62	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC63	28461/874	IC-ANALOGUE SWITCH DG411... QUAD, 15V SPST, ON-RESISTANCE<35R, 4 x N/O @ LOGIC 1, TTL	ANALOG DEVICES LTD	ADG411BR
IC64	28466/120	IC-DIGITAL OR-GATE 74HC32... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC32D

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1/2	**Audio generator (contd.)**			
IC65	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC66	44535/236	IC-PROGRAMMED PAL, SET OF 1, 2965, AUDIO COUNTER LOGIC.		
IC67	28467/101	IC-MICRO CONTROLLER, 82C54... PROGRAMMABLE INTERVAL TIMER, 8MHz, CMOS, 28 PIN, PLCC.	HARRIS SEMICONDUCTOR	CS82C54
IC68	28462/152	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC273... 8 INPUT, 8 BIT, OCTAL, WITH RESET, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC273D
IC69	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC70	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC71	28462/152	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC273... 8 INPUT, 8 BIT, OCTAL, WITH RESET, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC273D
IC72	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC73	28462/152	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC273... 8 INPUT, 8 BIT, OCTAL, WITH RESET, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC273D
IC74	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
L1	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L2	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
LKA	23435/990	CONNECTOR SHORTING, SOCKET, 2 WAY, FOR 0.64mm SQ PINS, 2.54mm PITCH, 9.6mm HIGH, FREE MOUNTING,	BERG ELECTRONICS	65474-001
PLA	23436/901	CONNECTOR MULTIWAY, PCB HEADER, 16 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	THOMAS & BETTS LTD	609-1607
PLB to PLF	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
R1	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R2 to R5	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R6	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R7	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R8	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R9	24811/182	RESISTOR-FIXED METAL-FILM 2K43 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K43-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1/2	**Audio generator (contd.)**			
R10	24811/182	RESISTOR-FIXED METAL-FILM 2K43 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K43-1%50ppm
R11	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R12	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R13	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R14	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R15	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R16	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R17	24811/184	RESISTOR-FIXED METAL-FILM 3K01 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K01-1%50ppm
R18	24811/186	RESISTOR-FIXED METAL-FILM 3K65 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K65-1%50ppm
R19	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R20	24811/188	RESISTOR-FIXED METAL-FILM 4K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K32-1%50ppm
R21	24811/192	RESISTOR-FIXED METAL-FILM 6K19 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K19-1%50ppm
R22 to R27	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R28	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R29	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R30	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R31	24811/203	RESISTOR-FIXED METAL-FILM 18K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-18K2-1%50ppm
R32	24811/209	RESISTOR-FIXED METAL-FILM 33K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-1%50ppm
R33	24811/612	RESISTOR-FIXED METAL-FILM 80K6 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-80K6-0.1%-15
R34	24811/612	RESISTOR-FIXED METAL-FILM 80K6 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-80K6-0.1%-15
R35	24811/611	RESISTOR-FIXED METAL-FILM 9K09 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-9K09-0.1%-15
R36	24811/610	RESISTOR-FIXED METAL-FILM 909R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-909R-0.1%-15
R37	24811/609	RESISTOR-FIXED METAL-FILM 90R9 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-90R9-0.1%-15
R38	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R39	24811/215	RESISTOR-FIXED METAL-FILM 56K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56K2-1%50ppm
R40	24811/215	RESISTOR-FIXED METAL-FILM 56K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56K2-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1/2	**Audio generator (contd.)**			
R41	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R42	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R43	24811/215	RESISTOR-FIXED METAL-FILM 56K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56K2-1%50ppm
R44	24811/215	RESISTOR-FIXED METAL-FILM 56K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56K2-1%50ppm
R45	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R46 to R48	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R49 to R54	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R55	24811/200	RESISTOR-FIXED METAL-FILM 13K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-13K-1%50ppm
R56	24811/207	RESISTOR-FIXED METAL-FILM 27K4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27K4-1%50ppm
R57	24811/195	RESISTOR-FIXED METAL-FILM 8K25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K25-1%50ppm
R58	24811/200	RESISTOR-FIXED METAL-FILM 13K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-13K-1%50ppm
R59	24811/204	RESISTOR-FIXED METAL-FILM 20K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20K-1%50ppm
R60	24811/200	RESISTOR-FIXED METAL-FILM 13K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-13K-1%50ppm
R61	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R62 to R65	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R66	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R67	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R68	24811/207	RESISTOR-FIXED METAL-FILM 27K4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27K4-1%50ppm
R69	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R70	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R71 to R73	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R74	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R75	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R76	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R77	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R78	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1/2	**Audio generator (contd.)**			
R79	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R80 to R84	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R85	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R86	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R87	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R88	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R89	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R90 to R93	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R94	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R95	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R96	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R98 to R100	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R101 to R104	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R105	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R106 to R108	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R109	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R110	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R111	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R112	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R113	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R114 to R118	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R119	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R120	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R121	24681/528	RESISTOR-NETWORK ISOLATED, THICK-FILM, 10K 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	SOMC16-03-103-G-REEL
R122	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R124	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A1/2	**Audio generator (contd.)**			
R126	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R128 to R141	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R142	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R143	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R144	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
TR1	28487/810	TRANSISTOR NPN BIPOLAR BSV52... 12V 400MHz 250mW 100mA MARKING CODE B2, SURFACE MOUNTED, SOT-23,	PHILIPS	BSV52
TR2	28459/102	TRANSISTOR N-CHANNEL-ENHANCE MOSFET IRFR121... 80V 20W 6A 0R27 SURFACE MOUNTED, TO-252AA, (IN TUBES).	HARRIS SEMICONDUCTOR	IRFR121(TUBE)
TR3	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE @ 2mA, NOISE 2dB @ 1KHz, MARKING CODE	PHILIPS	BC848B
TR4	28459/103	TRANSISTOR P-CHANNEL-ENHANCE MOSFET IRFR9121... 60V 20W 4A 0R6 SURFACE MOUNTED, TO-252AA, (IN	MOTOROLA INC.	MTD5P06E
TR5	28457/852	TRANSISTOR PNP BIPOLAR BSR15... 40V 200MHz 300mW 600mA MARKING CODE CH/T7p, SURFACE MOUNTED,	PHILIPS	BSR15

A2 Audio processor 2

When ordering, prefix circuit reference with A2.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829-832	Complete unit	Issue 14	
C1	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C2	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C3	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C4	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C5	26582/427	CAPACITOR-FIXED POLYESTER 470nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-447/065
C6	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C7	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C8	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C9	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C10	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C11	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C12	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C13	26386/820	CAPACITOR-FIXED CERAMIC 47pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-470-JP
C14	26582/427	CAPACITOR-FIXED POLYESTER 470nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-447/065
C15 to C18	26386/893	CAPACITOR-FIXED CERAMIC 330nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 2220, NICKEL	SYFER TECHNOLOGY LTD	2220-J-050-0334K-X-T
C23	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C24	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C25	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C26	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BB
C27	26421/142	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1CU-221B
C28	26421/108	CAPACITOR-FIXED ALUMINIUM 4.7uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-4R7-B
C29	26421/142	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1CU-221B
C30	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BB

A2 Audio processor 2 (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
C31	26582/427	CAPACITOR-FIXED POLYESTER 470nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-447/065
C32	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C33	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C34	26421/141	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1VU-101B
C35	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C36	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C37	26421/141	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1VU-101B
C38	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C39	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C40	26421/142	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1CU-221B
C41	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C42	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C43	26386/817	CAPACITOR-FIXED CERAMIC 27pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-270-JP
C44	26343/784	CAPACITOR-FIXED CERAMIC 68pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-680-JP
C45	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C46	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C47	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C101 to C199	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C200 to C209	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C210	26421/142	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1CU-221B
C211	26421/142	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1CU-221B
C212 to C214	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C220 to C229	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C230	26343/435	CAPACITOR-FIXED CERAMIC 220pF +/-2% 63V N750 SINGLELAYER, RADIAL, 2.5mm PWP, (TAPED).	VISHAY COMPONENTS	ROU-221-GAK-ACR-J

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A2 Audio processor 2 (contd.)				
D1	28383/909	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2822... DUAL, 8V 1pF 340mVf @ 1mA, IN SERIES, MARKING CODE C2,	HEWLETT-PACKARD	HSMS-2822-L31
D9	28383/903	DIODE SMALL-SIGNAL, BAV99... DUAL, 70V 100mA 1.1Vf @ 50mA, IN SERIES, MARKING CODE A7, SURFACE	PHILIPS	BAV99 (A7)
D10	28383/903	DIODE SMALL-SIGNAL, BAV99... DUAL, 70V 100mA 1.1Vf @ 50mA, IN SERIES, MARKING CODE A7, SURFACE	PHILIPS	BAV99 (A7)
D11	28383/909	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2822... DUAL, 8V 1pF 340mVf @ 1mA, IN SERIES, MARKING CODE C2,	HEWLETT-PACKARD	HSMS-2822-L31
D13	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D14	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D15	28383/903	DIODE SMALL-SIGNAL, BAV99... DUAL, 70V 100mA 1.1Vf @ 50mA, IN SERIES, MARKING CODE A7, SURFACE	PHILIPS	BAV99 (A7)
D16	28383/903	DIODE SMALL-SIGNAL, BAV99... DUAL, 70V 100mA 1.1Vf @ 50mA, IN SERIES, MARKING CODE A7, SURFACE	PHILIPS	BAV99 (A7)
D17	28383/934	DIODE SMALL-SIGNAL, LL4148... 500mW 50V 150mA 1Vf @ 10mA, SURFACE MOUNTED, MINI-MELF, (TAPED).	PHILIPS	PMLL4148L
D19	28383/934	DIODE SMALL-SIGNAL, LL4148... 500mW 50V 150mA 1Vf @ 10mA, SURFACE MOUNTED, MINI-MELF, (TAPED).	PHILIPS	PMLL4148L
D20	28371/216	DIODE ZENER, BZX84-C3V3... 350mW 3.3V 5% 250mA MARKING CODE Z14/W6, SURFACE MOUNTED, SOT-23,	PHILIPS	BZX84-C3V3
D21	28371/216	DIODE ZENER, BZX84-C3V3... 350mW 3.3V 5% 250mA MARKING CODE Z14/W6, SURFACE MOUNTED, SOT-23,	PHILIPS	BZX84-C3V3
IC1	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC2	28461/898	IC-ANALOGUE D/A-CONVERTER 7528... 8 INPUT, DUAL, 8-BIT, BUFFERED, MULTIPLYING, CMOS, 20 PIN,	ANALOG DEVICES LTD	AD7528JR
IC3	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC4	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	SILICONIX LTD	DG419DY
IC5	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC6	28461/356	IC-ANALOGUE OPERATIONAL AMP LF357N... SINGLE, LINEAR, SLEW-RATE 50V/uS TYP, JFET, 8 PIN,	NAT. SEMICONDUCTOR	LF357N
IC7	28461/676	IC-ANALOGUE COMPARATOR LM311... 2 INPUT, SINGLE, 15V I/P-OFFSET 7.5mV MAX, RESPONSE-TIME 200nS TYP,	PHILIPS	LM311D
IC8	28469/032	IC-DIGITAL INVERTER 74HC14... HEX, SCHMITT-TRIGGER OPERATION, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC14D
IC9	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC10	28461/803	IC-ANALOGUE VOLTAGE-REFERENCE LT1019... 5V PRECISION, OUTPUT VOLTAGE DRIFT 20ppm/DEG.C MAX,	LINEAR TECHNOLOGY	LT1019CS8-5
IC11 to IC13	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC14	28469/759	IC-ANALOGUE MULTIPLEXER DG508A... 8 INPUT, SINGLE, 15V & -15V, CMOS, 16 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	MUX-08FS

A2 Audio processor 2 (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
IC15	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC16	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC17	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	SILICONIX LTD	DG441DY
IC18	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC19	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	SILICONIX LTD	DG419DY
IC20	28461/898	IC-ANALOGUE D/A-CONVERTER 7528... 8 INPUT, DUAL, 8-BIT, BUFFERED, MULTIPLYING, CMOS, 20 PIN,	ANALOG DEVICES LTD	AD7528JR
IC21	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC22 to IC25	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	SILICONIX LTD	DG441DY
IC26	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
IC27	28461/953	IC-ANALOGUE RMS/DC CONVERTER AD637KD... 18V TOTAL-ERROR +/-0.5mV +/-0.2% OF READING,	ANALOG DEVICES LTD	AD637KD
IC28	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC29	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC30	28461/458	IC-ANALOGUE OPERATIONAL AMP OP37... 15V LOW NOISE, HI-SPEED, PRECISION, BIPOLAR, 8 PIN,	ANALOG DEVICES LTD	OP37GS
IC31	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC32	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	SILICONIX LTD	DG419DY
IC36	28469/759	IC-ANALOGUE MULTIPLEXER DG508A... 8 INPUT, SINGLE, 15V & -15V, CMOS, 16 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	MUX-08FS
IC37	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC38	28461/829	IC-ANALOGUE A/D CONVERTER ADC912AHS... 12 BIT, MICROPROCESSOR COMPATIBLE, 8/16 BIT BUS O/P,	ANALOG DEVICES LTD	ADC912AHS
IC39	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC40	28461/495	IC-ANALOGUE AUDIO-AMPLIFIER TDA2030... SINGLE, 28V 14W, MONOLITHIC, 5 PIN, TO-220.	SGS-THOMSON	TDA2030H
IC41	28461/384	IC-ANALOGUE OPERATIONAL AMP LF356N... SINGLE, LINEAR, SLEW-RATE 12V/uS TYP, JFET, 8 PIN,	NAT. SEMICONDUCTOR	LF356N
IC42	28461/356	IC-ANALOGUE OPERATIONAL AMP LF357N... SINGLE, LINEAR, SLEW-RATE 50V/uS TYP, JFET, 8 PIN,	NAT. SEMICONDUCTOR	LF357N
IC43	28461/676	IC-ANALOGUE COMPARATOR LM311... 2 INPUT, SINGLE, 15V I/P-OFFSET 7.5mV MAX, RESPONSE-TIME 200nS TYP,	PHILIPS	LM311D
IC44 to IC48	28467/111	IC-MICRO PERIPHERAL, PCF8574... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 8 DEVICE ADDRESS	PHILIPS	PCF8574T
IC49 to IC51	28465/056	IC-DIGITAL DECODER/DEMULTIPLEX 74HC139... 2 INPUT, 4 BIT, DUAL, INVERTING, 1 BIT ADDRESS,	PHILIPS	74HC139D
IC52	28461/717	IC-ANALOGUE VOLTAGE-REGULATOR 7905... SINGLE, 5V 1A NEGATIVE, LINEAR, MONOLITHIC, 3 PIN, TO-220.	NAT. SEMICONDUCTOR	LM7905CT

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A2 Audio processor 2 (contd.)				
IC53	28461/707	IC-ANALOGUE VOLTAGE-REGULATOR 7805... 5V 1A POSITIVE, LINEAR, MONOLITHIC, 3 PIN, TO-220.	NAT. SEMICONDUCTOR	uA7805UC
IC54	28461/828	IC-ANALOGUE D/A-CONVERTER DAC-08... 8 BIT, HIGH SPEED MULTIPLYING, MONOLITHIC, 16 PIN,	NAT. SEMICONDUCTOR	DAC-0801LCM
IC55	28462/151	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC374... 1 INPUT, OCTAL, NON-INVERTING, POS EDGE TRIGGER, TRI-STATE,	PHILIPS	74HC374D
IC56	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC57	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC58	28461/963	IC-ANALOGUE COMPARATOR LT1016... RESPONSE-TIME 14nS MAX, PRECISION, 8 PIN, DUAL-IN-LINE.	MAXIM INTEG PRODUCTS	LT1016CN8
IC59	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	SILICONIX LTD	DG419DY
IC60	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC61 to IC63	28464/175	IC-DIGITAL COUNTER 74HC191... 4 BIT, SINGLE, BINARY UP/DOWN, SYNCHRONOUS, PRESETTABLE,	PHILIPS	74HC191D
IC64	28461/804	IC-ANALOGUE D/A-CONVERTER DAC-312... SINGLE, 12 BIT, HIGH SPEED MULTIPLYING, BIPOLAR, 20 PIN,	ANALOG DEVICES LTD	DAC-312HS
IC65	28469/552	IC-DIGITAL BUFFER/LINE-DRIVER 74HC541... OCTAL, TRI-STATE, NON-INVERTING, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC541D
IC66	28469/552	IC-DIGITAL BUFFER/LINE-DRIVER 74HC541... OCTAL, TRI-STATE, NON-INVERTING, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC541D
IC67	28465/055	IC-DIGITAL DECODER/DEMULTIPLEX 74HC138... 3 INPUT, 8 BIT, SINGLE, INVERTING, 3 BIT ADDRESS,	PHILIPS	74HC138D
L1 to L5	23642/535	INDUCTOR-FIXED 1uH +/- 5% MOULDED-EPOXY, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
PLA	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLB	23436/900	CONNECTOR MULTIWAY, PCB HEADER, 10 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7108
PLC to PLK	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLM	23436/901	CONNECTOR MULTIWAY, PCB HEADER, 16 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	THOMAS & BETTS LTD	609-1607
PLQ	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
R1	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R2	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R3	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R4	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm

A2 Audio processor 2 (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R5	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R6	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R7	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R8	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R9	24811/231	RESISTOR-FIXED METAL-FILM 274K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274K-1%50ppm
R10	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R11	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R12	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R13	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R14	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R15	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R16	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R17	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R18	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R19	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R20	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R21	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R22	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R23	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R24	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R25	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R26	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R27	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R28	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R29	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R30	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A2 Audio processor 2 (contd.)				
R31	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R32	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R33	24811/641	RESISTOR-FIXED METAL-FILM 2K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K0-0.1%-15
R34	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R35	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R36	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R37	24811/164	RESISTOR-FIXED METAL-FILM 432R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-432R-1%50ppm
R38	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R39	24811/160	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301R-1%50ppm
R40	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R41	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R42	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R43	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R44	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R45	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R46	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R47	24811/209	RESISTOR-FIXED METAL-FILM 33K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-1%50ppm
R48	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R49	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R50	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R51	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R52	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R53	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R54	24811/206	RESISTOR-FIXED METAL-FILM 24K3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-24K3-1%50ppm
R55	24811/206	RESISTOR-FIXED METAL-FILM 24K3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-24K3-1%50ppm
R56	24811/211	RESISTOR-FIXED METAL-FILM 39K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-39K2-1%50ppm

A2 Audio processor 2 (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R57	24811/211	RESISTOR-FIXED METAL-FILM 39K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-39K2-1%50ppm
R58	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R59	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R66	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R67	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R68	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R69	24811/217	RESISTOR-FIXED METAL-FILM 68K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68K1-1%50ppm
R70 to R73	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R74	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R75	24811/101	RESISTOR-FIXED METAL-FILM 1R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1R-1%-50ppm
R76	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R77	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R78	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R79	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R80	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R81	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R82	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R83	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R84	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R85	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R86 to R92	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R93	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R94	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R95	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R96	24811/198	RESISTOR-FIXED METAL-FILM 11K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-11K-1%50ppm
R97	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A2 Audio processor 2 (contd.)				
R98	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R99 to R107	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R108	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R109	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R110	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R111	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R112	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R113	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R114	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R115	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R116	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R117	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R118	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R120	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R121	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R122	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R123	24811/168	RESISTOR-FIXED METAL-FILM 619R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-619R-1%50ppm
R124	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R125	24811/235	RESISTOR-FIXED METAL-FILM 392K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-392K-1%50ppm
R126	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R127	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R128 to R136	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R137	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
TR1	28487/811	TRANSISTOR NPN BIPOLAR BC818-40... 25V 170MHz 330mW 500mA 250hFE MIN @ 100mA, MARKING CODE 6G,	PHILIPS	BC818-40
TR2	28459/061	TRANSISTOR N-CHANNEL-DEPLETION JFET BSR56... 40V 250mW 50mA MARKING CODE M4, SURFACE MOUNTED,	PHILIPS	BSR56

A2/2 Audio processor 2

When ordering, prefix circuit reference with A2/2.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44830-044	Complete unit	Issue 04	
C1	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C2	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C3	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C4	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C5	26386/997	CAPACITOR-FIXED CERAMIC 470nF +/-10% 50V X7R, MULTILAYER, SURFACE-MOUNTED, SIZE 1812, NICKEL	PHILIPS	1812-2B-474-K9BB
C6	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C7	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C8	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C9	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C10	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C11	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C12	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C13	26386/820	CAPACITOR-FIXED CERAMIC 47pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-470-JP
C14 to C18	26386/992	CAPACITOR-FIXED CERAMIC 330nF +/-10% 50V X7R, MULTILAYER, SURFACE-MOUNTED, SIZE 1812, NICKEL	PHILIPS	1812-2B-334-K9BB
C23	26451/009	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-470P
C24	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C25	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C26	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C27	26451/012	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 8.3 x 8.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-101P
C28	26451/002	CAPACITOR-FIXED ALUMINIUM 4.7uF +/-20% 35V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1VA-4R7R
C29	26451/012	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 8.3 x 8.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-101P
C30	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C31	26386/997	CAPACITOR-FIXED CERAMIC 470nF +/-10% 50V X7R, MULTILAYER, SURFACE-MOUNTED, SIZE 1812, NICKEL	PHILIPS	1812-2B-474-K9BB
C32	26451/010	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-101P

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A2/2	**Audio processor 2 (contd.)**			
C33	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C34	26451/012	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 8.3 x 8.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-101P
C35	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C36	26386/992	CAPACITOR-FIXED CERAMIC 330nF +/-10% 50V X7R, MULTILAYER, SURFACE-MOUNTED, SIZE 1812, NICKEL	PHILIPS	1812-2B-334-K9BB
C37	26451/012	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 8.3 x 8.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-101P
C38	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C39	26386/992	CAPACITOR-FIXED CERAMIC 330nF +/-10% 50V X7R, MULTILAYER, SURFACE-MOUNTED, SIZE 1812, NICKEL	PHILIPS	1812-2B-334-K9BB
C40	26451/012	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 8.3 x 8.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-101P
C41	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C42	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C43	26386/817	CAPACITOR-FIXED CERAMIC 27pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-270-JP
C44	26343/784	CAPACITOR-FIXED CERAMIC 68pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-680-JP
C45	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C46	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C47	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C101 to C199	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C200 to C209	26451/004	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	RUBYCON CAPACITORS	35-REV-10
C210	26451/012	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 8.3 x 8.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-101P
C211	26451/012	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 8.3 x 8.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-101P
C212 to C214	26451/004	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	RUBYCON CAPACITORS	35-REV-10
C220 to C229	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C230	26386/828	CAPACITOR-FIXED CERAMIC 220pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-221-JP
C240 to C244	26451/012	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 8.3 x 8.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-101P
C245	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A2/2	**Audio processor 2 (contd.)**			
D1	28383/909	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2822... DUAL, 8V 1pF 340mVf @ 1mA, IN SERIES, MARKING CODE C2,	HEWLETT-PACKARD	HSMS-2822-L31
D9	28383/903	DIODE SMALL-SIGNAL, BAV99... DUAL, 70V 100mA 1.1Vf @ 50mA, IN SERIES, MARKING CODE A7, SURFACE	PHILIPS	BAV99 (A7)
D10	28383/903	DIODE SMALL-SIGNAL, BAV99... DUAL, 70V 100mA 1.1Vf @ 50mA, IN SERIES, MARKING CODE A7, SURFACE	PHILIPS	BAV99 (A7)
D11	28383/909	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2822... DUAL, 8V 1pF 340mVf @ 1mA, IN SERIES, MARKING CODE C2,	HEWLETT-PACKARD	HSMS-2822-L31
D13	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D14	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D15	28383/903	DIODE SMALL-SIGNAL, BAV99... DUAL, 70V 100mA 1.1Vf @ 50mA, IN SERIES, MARKING CODE A7, SURFACE	PHILIPS	BAV99 (A7)
D16	28383/903	DIODE SMALL-SIGNAL, BAV99... DUAL, 70V 100mA 1.1Vf @ 50mA, IN SERIES, MARKING CODE A7, SURFACE	PHILIPS	BAV99 (A7)
D17	28383/934	DIODE SMALL-SIGNAL, LL4148... 500mW 50V 150mA 1Vf @ 10mA, SURFACE MOUNTED, MINI-MELF, (8mm TAPE -	PHILIPS	PMLL4148L
D19	28383/934	DIODE SMALL-SIGNAL, LL4148... 500mW 50V 150mA 1Vf @ 10mA, SURFACE MOUNTED, MINI-MELF, (8mm TAPE -	PHILIPS	PMLL4148L
D20	28371/216	DIODE ZENER, BZX84-C3V3... 350mW 3.3V 5% 250mA MARKING CODE Z14/W6, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C3V3
D21	28371/216	DIODE ZENER, BZX84-C3V3... 350mW 3.3V 5% 250mA MARKING CODE Z14/W6, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C3V3
IC1	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC2	28461/898	IC-ANALOGUE D/A-CONVERTER 7528... 8 INPUT, DUAL, 8-BIT, BUFFERED, MULTIPLYING, CMOS, 20 PIN,	ANALOG DEVICES LTD	AD7528JR
IC3	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC4	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC5	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC6	28461/458	IC-ANALOGUE OPERATIONAL AMP OP37... 15V LOW NOISE, HI-SPEED, PRECISION, BIPOLAR, 8 PIN,	ANALOG DEVICES LTD	OP37GS
IC7	28461/676	IC-ANALOGUE COMPARATOR LM311... 2 INPUT, SINGLE, 15V I/P-OFFSET 7.5mV MAX, RESPONSE-TIME 200nS TYP,	PHILIPS	LM311D
IC8	28469/032	IC-DIGITAL INVERTER 74HC14... HEX, SCHMITT-TRIGGER OPERATION, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC14D
IC9	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC10	28461/803	IC-ANALOGUE VOLTAGE-REFERENCE LT1019... 5V PRECISION, OUTPUT VOLTAGE DRIFT 20ppm/DEG.C MAX,	LINEAR TECHNOLOGY	LT1019CS8-5
IC11 to IC13	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC14	28469/759	IC-ANALOGUE MULTIPLEXER DG508A... 8 INPUT, SINGLE, 15V & -15V, CMOS, 16 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	MUX-08FS

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A2/2	**Audio processor 2 (contd.)**			
IC15	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC16	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC17	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	TEMIC UK LTD	DG441DY
IC18	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC19	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC20	28461/898	IC-ANALOGUE D/A-CONVERTER 7528... 8 INPUT, DUAL, 8-BIT, BUFFERED, MULTIPLYING, CMOS, 20 PIN,	ANALOG DEVICES LTD	AD7528JR
IC21	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC22 to IC25	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	TEMIC UK LTD	DG441DY
IC26	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
IC27	28461/041	IC-ANALOGUE RMS/DC CONVERTER AD637JR... 18V TOTAL-ERROR +/-1mV +/-0.5% OF READING, MONOLITHIC,	ANALOG DEVICES LTD	AD637JR
IC28	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC29	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC30	28461/458	IC-ANALOGUE OPERATIONAL AMP OP37... 15V LOW NOISE, HI-SPEED, PRECISION, BIPOLAR, 8 PIN,	ANALOG DEVICES LTD	OP37GS
IC31	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC32	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC36	28469/759	IC-ANALOGUE MULTIPLEXER DG508A... 8 INPUT, SINGLE, 15V & -15V, CMOS, 16 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	MUX-08FS
IC37	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC38	28461/829	IC-ANALOGUE A/D CONVERTER ADC912AHS... 12 BIT, MICROPROCESSOR COMPATIBLE, 8/16 BIT BUS O/P,	ANALOG DEVICES LTD	ADC912AHS
IC39	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC40	28461/495	IC-ANALOGUE AUDIO-AMPLIFIER TDA2030... SINGLE, 28V 14W, MONOLITHIC, 5 PIN, TO-220.	SGS-THOMSON	TDA2030H
IC41	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
IC42	28461/458	IC-ANALOGUE OPERATIONAL AMP OP37... 15V LOW NOISE, HI-SPEED, PRECISION, BIPOLAR, 8 PIN,	ANALOG DEVICES LTD	OP37GS
IC43	28461/676	IC-ANALOGUE COMPARATOR LM311... 2 INPUT, SINGLE, 15V I/P-OFFSET 7.5mV MAX, RESPONSE-TIME 200nS TYP,	PHILIPS	LM311D
IC44 to IC48	28467/111	IC-MICRO PERIPHERAL, PCF8574... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 8 DEVICE ADDRESS	PHILIPS	PCF8574T
IC49 to IC51	28465/056	IC-DIGITAL DECODER/DEMULTIPLEX 74HC139... 2 INPUT, 4 BIT, DUAL, INVERTING, 1 BIT ADDRESS,	PHILIPS	74HC139D
IC52	28461/717	IC-ANALOGUE VOLTAGE-REGULATOR 7905... SINGLE, 5V 1A NEGATIVE, LINEAR, MONOLITHIC, 3 PIN, TO-220.	NAT. SEMICONDUCTOR	LM7905CT

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A2/2	**Audio processor 2 (contd.)**			
IC53	28461/707	IC-ANALOGUE VOLTAGE-REGULATOR 7805... 5V 1A POSITIVE, LINEAR, MONOLITHIC, 3 PIN, TO-220.	NAT. SEMICONDUCTOR	uA7805UC
IC54	28461/828	IC-ANALOGUE D/A-CONVERTER DAC-08... 8 BIT, HIGH SPEED MULTIPLYING, MONOLITHIC, 16 PIN,	NAT. SEMICONDUCTOR	DAC-0801LCM
IC55	28462/151	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC374... 1 INPUT, OCTAL, NON-INVERTING, POS EDGE TRIGGER, TRI-STATE,	PHILIPS	74HC374D
IC56	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC57	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC58	28461/042	IC-ANALOGUE COMPARATOR LT1016... I/P-OFFSET 3mV MAX, RESPONSE TIME 14nS MAX, TTL, 8 PIN,	MAXIM INTEG PRODUCTS	LT1016CS8
IC59	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC60	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC61 to IC63	28464/175	IC-DIGITAL COUNTER 74HC191... 4 BIT, SINGLE, BINARY UP/DOWN, SYNCHRONOUS, PRESETTABLE,	PHILIPS	74HC191D
IC64	28461/804	IC-ANALOGUE D/A-CONVERTER DAC-312... SINGLE, 12 BIT, HIGH SPEED MULTIPLYING, BIPOLAR, 20 PIN,	ANALOG DEVICES LTD	DAC-312HS
IC65	28469/552	IC-DIGITAL BUFFER/LINE-DRIVER 74HC541... OCTAL, TRI-STATE, NON-INVERTING, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC541D
IC66	28469/552	IC-DIGITAL BUFFER/LINE-DRIVER 74HC541... OCTAL, TRI-STATE, NON-INVERTING, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC541D
IC67	28465/055	IC-DIGITAL DECODER/DEMULTIPLEX 74HC138... 3 INPUT, 8 BIT, SINGLE, INVERTING, 3 BIT ADDRESS,	PHILIPS	74HC138D
L1 to L5	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
PLA	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLB	23436/900	CONNECTOR MULTIWAY, PCB HEADER, 10 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7108
PLC to PLK	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLM	23436/901	CONNECTOR MULTIWAY, PCB HEADER, 16 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	THOMAS & BETTS LTD	609-1607
PLQ	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
R1	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R2	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R3	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R4	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A2/2	**Audio processor 2 (contd.)**			
R5	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R6	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R7	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R8	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R9	24811/231	RESISTOR-FIXED METAL-FILM 274K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274K-1%50ppm
R10	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R11	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R12	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R13	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R14	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R15	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R16	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R17	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R18	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R19	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R20	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R21	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R22	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R23	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R24	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R25	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R26	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R27	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R28	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R29	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R30	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A2/2	**Audio processor 2 (contd.)**			
R31	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R32	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R33	24811/641	RESISTOR-FIXED METAL-FILM 2K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K0-0.1%-15
R34	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R35	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R36	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R37	24811/164	RESISTOR-FIXED METAL-FILM 432R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-432R-1%50ppm
R38	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R39	24811/160	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301R-1%50ppm
R40	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R41	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R42	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R43	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R44	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R45	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R46	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R47	24811/209	RESISTOR-FIXED METAL-FILM 33K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-1%50ppm
R48	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R49	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R50	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R51	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R52	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R53	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R54	24811/206	RESISTOR-FIXED METAL-FILM 24K3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-24K3-1%50ppm
R55	24811/206	RESISTOR-FIXED METAL-FILM 24K3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-24K3-1%50ppm
R56	24811/211	RESISTOR-FIXED METAL-FILM 39K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-39K2-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A2/2	**Audio processor 2 (contd.)**			
R57	24811/211	RESISTOR-FIXED METAL-FILM 39K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-39K2-1%50ppm
R58	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R59	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R66	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R67	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R68	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R69	24811/217	RESISTOR-FIXED METAL-FILM 68K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68K1-1%50ppm
R70 to R73	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R74	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R75	24811/101	RESISTOR-FIXED METAL-FILM 1R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1R-1%-50ppm
R76	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R77	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R78	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R79	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R80	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R81	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R82	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R83	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R84	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R85	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R86 to R92	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R93	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R94	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R95	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R96	24811/198	RESISTOR-FIXED METAL-FILM 11K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-11K-1%50ppm
R97	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A2/2	**Audio processor 2 (contd.)**			
R98	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R99 to R107	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R108	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R109	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R110	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R111	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R112	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R113	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R114	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R115	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R116	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R117	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R118	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R120	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R121	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R122	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R123	24811/168	RESISTOR-FIXED METAL-FILM 619R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-619R-1%50ppm
R124	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R125	24811/235	RESISTOR-FIXED METAL-FILM 392K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-392K-1%50ppm
R126	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R127	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R128 to R136	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R137	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
TR1	28487/811	TRANSISTOR NPN BIPOLAR BC818-40... 25V 170MHz 330mW 500mA 250hFE MIN @ 100mA, MARKING CODE 6G,	PHILIPS	BC818-40
TR2	28459/061	TRANSISTOR N-CHANNEL-DEPLETION JFET BSR56... 40V 250mW 50mA MARKING CODE M4, SURFACE MOUNTED,	PHILIPS	BSR56

A3 Audio processor 1

When ordering, prefix circuit reference with A3.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829-833	Complete unit	Issue 19	
C1	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C2	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C3	26582/203	CAPACITOR-FIXED POLYESTER 15nF +/-10% 250V RADIAL, 10.2mm PWP, (LOOSE).	VISHAY COMPONENTS	MKT-1822-315/405
C4	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C5	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C6	26386/814	CAPACITOR-FIXED CERAMIC 15pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-150-JP
C7	26878/406	CAPACITOR-VARIABLE POLYPROPYLENE 2pF to 10pF 100V VERTICAL-PCB MOUNT, 7.5mm DIA, 10mm LONG, 3 PIN,	PHILIPS	2222-808-11109
C8	26538/910	CAPACITOR-FIXED POLYSTYRENE 2.2nF +/-1% 63V 125 ppm/DEG.C, RADIAL, 5.08mm PWP, SQUARE, WIRES ON	LCR COMPONENTS	EXFS/HR-2200pF-63V
C9 to C11	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C12	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C13	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C14	26343/935	CAPACITOR-FIXED CERAMIC 4.7nF +/-1% 63V NP0 MULTILAYER, RADIAL, 5.08mm PWP, (LOOSE OR TAPED).	AVX LTD	SR21-5A-472-FAA
C15	26582/203	CAPACITOR-FIXED POLYESTER 15nF +/-10% 250V RADIAL, 10.2mm PWP, (LOOSE).	VISHAY COMPONENTS	MKT-1822-315/405
C16	26538/827	CAPACITOR-FIXED POLYSTYRENE 220pF +/-2% 63V 150 ppm/DEG.C, RADIAL, 7.6mm PWP, (TAPED).	LCR COMPONENTS	EP9-220pF-2%-63V
C17	26878/408	CAPACITOR-VARIABLE POLYPROPYLENE 5.5pF to 65pF 100V VERTICAL-PCB MOUNT, 10mm DIA, 10mm LONG, 3	PHILIPS	2222-808-32659
C18	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C19	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C20	26386/814	CAPACITOR-FIXED CERAMIC 15pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-150-JP
C21	26878/406	CAPACITOR-VARIABLE POLYPROPYLENE 2pF to 10pF 100V VERTICAL-PCB MOUNT, 7.5mm DIA, 10mm LONG, 3 PIN,	PHILIPS	2222-808-11109
C22	26538/910	CAPACITOR-FIXED POLYSTYRENE 2.2nF +/-1% 63V 125 ppm/DEG.C, RADIAL, 5.08mm PWP, SQUARE, WIRES ON	LCR COMPONENTS	EXFS/HR-2200pF-63V
C23 to C25	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C26	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C27	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC

A3 Audio processor 1 (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
C28	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C29	26386/814	CAPACITOR-FIXED CERAMIC 15pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-150-JP
C30	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C31	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C32	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C33	26386/814	CAPACITOR-FIXED CERAMIC 15pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-150-JP
C34	26538/827	CAPACITOR-FIXED POLYSTYRENE 220pF +/-2% 63V 150 ppm/DEG.C, RADIAL, 7.6mm PWP, (TAPED).	LCR COMPONENTS	EP9-220pF-2%-63V
C35	26878/408	CAPACITOR-VARIABLE POLYPROPYLENE 5.5pF to 65pF 100V VERTICAL-PCB MOUNT, 10mm DIA, 10mm LONG, 3	PHILIPS	2222-808-32659
C36	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C37	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C38	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C39	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C40	26421/141	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1VU-101B
C41	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C42	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C43	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C44	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C45	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C46	26421/141	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1VU-101B
C47	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C48	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C49	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C50	26386/814	CAPACITOR-FIXED CERAMIC 15pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-150-JP
C51	26386/814	CAPACITOR-FIXED CERAMIC 15pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-150-JP
C52 to C55	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C100 to C123	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A3 Audio processor 1 (contd.)				
C124	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C125	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C126	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C127	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C128	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C129	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C130 to C229	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C230 to C244	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C245	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C246	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C249 to C256	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C258 to C265	26486/225	CAPACITOR-FIXED TANTALUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	AVX LTD	TAP-10-M-35-CRW
C266 to C269	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C270	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C271	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C272 to C275	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
D1 to D4	28335/485	DIODE SMALL-SIGNAL, BAV45... 20V 50mA 1.3pF 1Vf @ 10mA, LOW LEAKAGE TYPE, 5pA Ir @ 5Vr, METAL-CASED,	PHILIPS	BAV45
D5	28371/412	DIODE ZENER, BZX84-C5V1... 350mW 5.1V 5% 250mA MARKING CODE Z2, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V1
D6	28371/412	DIODE ZENER, BZX84-C5V1... 350mW 5.1V 5% 250mA MARKING CODE Z2, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V1
D7	28383/903	DIODE SMALL-SIGNAL, BAV99... DUAL, 70V 100mA 1.1Vf @ 50mA, IN SERIES, MARKING CODE A7, SURFACE	PHILIPS	BAV99 (A7)
D8 to D13	28383/934	DIODE SMALL-SIGNAL, LL4148... 500mW 50V 150mA 1Vf @ 10mA, SURFACE MOUNTED, MINI-MELF, (8mm TAPE -	PHILIPS	PMLL4148L
IC1	28469/759	IC-ANALOGUE MULTIPLEXER DG508A... 8 INPUT, SINGLE, 15V & -15V, CMOS, 16 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	MUX-08FS
IC2	28461/810	IC-ANALOGUE OPERATIONAL AMP OPA602AU... SINGLE, 15V PRECISION HI SPEED, SETTLING TIME 1uS, GAIN	BURR-BROWN INTERNAT	OPA602AU

A3 Audio processor 1 (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
IC3	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC4	28461/458	IC-ANALOGUE OPERATIONAL AMP OP37... 15V LOW NOISE, HI-SPEED, PRECISION, BIPOLAR, 8 PIN,	ANALOG DEVICES LTD	OP37GS
IC5	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC6	28461/458	IC-ANALOGUE OPERATIONAL AMP OP37... 15V LOW NOISE, HI-SPEED, PRECISION, BIPOLAR, 8 PIN,	ANALOG DEVICES LTD	OP37GS
IC7	28385/995	RELAY SOLID-STATE, OPTO-COUPLED, N/O, SINGLE 1.2V CONTROL, 100V, 40mA MAX LOAD, MOS O/P, <0.5uV O/P	HEWLETT-PACKARD	HSSR-8200 OPTION 300
IC8	28461/810	IC-ANALOGUE OPERATIONAL AMP OPA602AU... SINGLE, 15V PRECISION HI SPEED, SETTLING TIME 1uS, GAIN	BURR-BROWN INTERNAT	OPA602AU
IC9	28461/820	IC-ANALOGUE D/A-CONVERTER 7248A... SINGLE, 15V 12 BIT, 8+4 LOADING, CMOS, 20 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	AD7248AAR
IC10	28469/759	IC-ANALOGUE MULTIPLEXER DG508A... 8 INPUT, SINGLE, 15V & -15V, CMOS, 16 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	MUX-08FS
IC11	28461/458	IC-ANALOGUE OPERATIONAL AMP OP37... 15V LOW NOISE, HI-SPEED, PRECISION, BIPOLAR, 8 PIN,	ANALOG DEVICES LTD	OP37GS
IC12	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC13	28461/458	IC-ANALOGUE OPERATIONAL AMP OP37... 15V LOW NOISE, HI-SPEED, PRECISION, BIPOLAR, 8 PIN,	ANALOG DEVICES LTD	OP37GS
IC14	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC15	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	TEMIC UK LTD	DG441DY
IC16	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
IC17	28385/995	RELAY SOLID-STATE, OPTO-COUPLED, N/O, SINGLE 1.2V CONTROL, 100V, 40mA MAX LOAD, MOS O/P, <0.5uV O/P	HEWLETT-PACKARD	HSSR-8200 OPTION 300
IC18	28461/810	IC-ANALOGUE OPERATIONAL AMP OPA602AU... SINGLE, 15V PRECISION HI SPEED, SETTLING TIME 1uS, GAIN	BURR-BROWN INTERNAT	OPA602AU
IC19	28461/820	IC-ANALOGUE D/A-CONVERTER 7248A... SINGLE, 15V 12 BIT, 8+4 LOADING, CMOS, 20 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	AD7248AAR
IC20	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
IC21	28469/759	IC-ANALOGUE MULTIPLEXER DG508A... 8 INPUT, SINGLE, 15V & -15V, CMOS, 16 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	MUX-08FS
IC22	28461/458	IC-ANALOGUE OPERATIONAL AMP OP37... 15V LOW NOISE, HI-SPEED, PRECISION, BIPOLAR, 8 PIN,	ANALOG DEVICES LTD	OP37GS
IC23	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC24	28461/458	IC-ANALOGUE OPERATIONAL AMP OP37... 15V LOW NOISE, HI-SPEED, PRECISION, BIPOLAR, 8 PIN,	ANALOG DEVICES LTD	OP37GS
IC25	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
IC26	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
IC27	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC28	28461/834	IC-ANALOGUE GAIN/LOSS CIRCUIT SC11310... SINGLE, 5V PROGRAMMABLE FROM -25.5 TO +25.5dB IN 0.1dB	SIERRA SEMICONDUCTOR	SC11310CV

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A3 Audio processor 1 (contd.)				
IC29	28461/831	IC-ANALOGUE FILTER MAX270... DUAL, INDEPENDENT, 2nd-ORDER, CONTINUOUS-TIME, LOW PASS, 1-25KHz,	MAXIM INTEG PRODUCTS	MAX270CWP
IC30	28461/830	IC-ANALOGUE FILTER MAX260A... DUAL, 5V SWITCHED CAPACITOR, SECOND ORDER, MICROPROCESSOR INTERFACE,	MAXIM INTEG PRODUCTS	MAX260ACWG
IC31	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	TEMIC UK LTD	DG441DY
IC32	28461/830	IC-ANALOGUE FILTER MAX260A... DUAL, 5V SWITCHED CAPACITOR, SECOND ORDER, MICROPROCESSOR INTERFACE,	MAXIM INTEG PRODUCTS	MAX260ACWG
IC33	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	TEMIC UK LTD	DG441DY
IC34	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	TEMIC UK LTD	DG441DY
IC35	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
IC36	28461/831	IC-ANALOGUE FILTER MAX270... DUAL, INDEPENDENT, 2nd-ORDER, CONTINUOUS-TIME, LOW PASS, 1-25KHz,	MAXIM INTEG PRODUCTS	MAX270CWP
IC37	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	TEMIC UK LTD	DG441DY
IC38	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
IC39	28461/898	IC-ANALOGUE D/A-CONVERTER 7528... 8 INPUT, DUAL, 8-BIT, BUFFERED, MULTIPLYING, CMOS, 20 PIN,	ANALOG DEVICES LTD	AD7528JR
IC40	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC41	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
IC42	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC43	28461/834	IC-ANALOGUE GAIN/LOSS CIRCUIT SC11310... SINGLE, 5V PROGRAMMABLE FROM -25.5 TO +25.5dB IN 0.1dB	SIERRA SEMICONDUCTOR	SC11310CV
IC44	28461/831	IC-ANALOGUE FILTER MAX270... DUAL, INDEPENDENT, 2nd-ORDER, CONTINUOUS-TIME, LOW PASS, 1-25KHz,	MAXIM INTEG PRODUCTS	MAX270CWP
IC45	28461/830	IC-ANALOGUE FILTER MAX260A... DUAL, 5V SWITCHED CAPACITOR, SECOND ORDER, MICROPROCESSOR INTERFACE,	MAXIM INTEG PRODUCTS	MAX260ACWG
IC46	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	TEMIC UK LTD	DG441DY
IC47	28461/830	IC-ANALOGUE FILTER MAX260A... DUAL, 5V SWITCHED CAPACITOR, SECOND ORDER, MICROPROCESSOR INTERFACE,	MAXIM INTEG PRODUCTS	MAX260ACWG
IC48	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	TEMIC UK LTD	DG441DY
IC49	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	TEMIC UK LTD	DG441DY
IC50	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
IC51	28461/831	IC-ANALOGUE FILTER MAX270... DUAL, INDEPENDENT, 2nd-ORDER, CONTINUOUS-TIME, LOW PASS, 1-25KHz,	MAXIM INTEG PRODUCTS	MAX270CWP
IC52	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	TEMIC UK LTD	DG441DY
IC53	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC54	28461/898	IC-ANALOGUE D/A-CONVERTER 7528... 8 INPUT, DUAL, 8-BIT, BUFFERED, MULTIPLYING, CMOS, 20 PIN,	ANALOG DEVICES LTD	AD7528JR

A3 Audio processor 1 (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
IC55	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC56	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	TEMIC UK LTD	DG441DY
IC57	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC58	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC59	28467/111	IC-MICRO PERIPHERAL, PCF8574... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 8 DEVICE ADDRESS	PHILIPS	PCF8574T
IC60	28461/673	IC-ANALOGUE COMPARATOR LM339... QUAD, SINGLE SUPPLY, BIPOLAR, 14 PIN, SMALL-OUTLINE.	PHILIPS	LM339D
IC61	28467/111	IC-MICRO PERIPHERAL, PCF8574... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 8 DEVICE ADDRESS	PHILIPS	PCF8574T
IC62	28467/110	IC-MICRO PERIPHERAL, PCF8574A... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 16 DEVICE ADDRESS	PHILIPS	PCF8574AT
IC63	28467/110	IC-MICRO PERIPHERAL, PCF8574A... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 16 DEVICE ADDRESS	PHILIPS	PCF8574AT
IC64	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC65	28464/185	IC-DIGITAL COUNTER 74HC160... 4 INPUT, 4 BIT, SINGLE, BCD, PRESETTABLE, SYNCHRONOUS,	PHILIPS	74HC160D
IC66	28462/438	IC-DIGITAL LATCH 74HC373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC373D
IC67	28462/438	IC-DIGITAL LATCH 74HC373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC373D
IC68	28465/056	IC-DIGITAL DECODER/DEMULTIPLEX 74HC139... 2 INPUT, 4 BIT, DUAL, INVERTING, 1 BIT ADDRESS,	PHILIPS	74HC139D
IC69	28462/438	IC-DIGITAL LATCH 74HC373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC373D
IC70	28465/056	IC-DIGITAL DECODER/DEMULTIPLEX 74HC139... 2 INPUT, 4 BIT, DUAL, INVERTING, 1 BIT ADDRESS,	PHILIPS	74HC139D
IC71	28465/056	IC-DIGITAL DECODER/DEMULTIPLEX 74HC139... 2 INPUT, 4 BIT, DUAL, INVERTING, 1 BIT ADDRESS,	PHILIPS	74HC139D
IC72	28462/438	IC-DIGITAL LATCH 74HC373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC373D
IC73	28465/056	IC-DIGITAL DECODER/DEMULTIPLEX 74HC139... 2 INPUT, 4 BIT, DUAL, INVERTING, 1 BIT ADDRESS,	PHILIPS	74HC139D
IC74	28465/056	IC-DIGITAL DECODER/DEMULTIPLEX 74HC139... 2 INPUT, 4 BIT, DUAL, INVERTING, 1 BIT ADDRESS,	PHILIPS	74HC139D
IC75	28465/065	IC-DIGITAL DECODER/DEMULTIPLEX 74HC154... 4-TO-16 LINE, CMOS-H/SPEED, 24 PIN, SMALL-OUTLINE.	PHILIPS	74HC154D
IC76	28467/101	IC-MICRO CONTROLLER, 82C54... PROGRAMMABLE INTERVAL TIMER, 8MHz, CMOS, 28 PIN, PLCC.	HARRIS SEMICONDUCTOR	CS82C54
IC77	28467/101	IC-MICRO CONTROLLER, 82C54... PROGRAMMABLE INTERVAL TIMER, 8MHz, CMOS, 28 PIN, PLCC.	HARRIS SEMICONDUCTOR	CS82C54
IC78	28469/058	IC-DIGITAL BUFFER/LINE-DRIVER 74HC244... 4 INPUT, 4 BIT, DUAL, NON-INVERTING, TRI-STATE BUS,	PHILIPS	74HC244D
IC79	28466/120	IC-DIGITAL OR-GATE 74HC32... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC32D

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A3 Audio processor 1 (contd.)				
L1 to L5	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L6 to L13	23642/512	INDUCTOR-FIXED 22uH +/- 5% EPOXY-MOULD, 110mA 3R7 MAX, 30 Q @ 2.5 MHz, 25 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-220-J
PLA to PLH	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLJ	23436/901	CONNECTOR MULTIWAY, PCB HEADER, 16 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	THOMAS & BETTS LTD	609-1607
PLM	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLN	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
R1	24811/188	RESISTOR-FIXED METAL-FILM 4K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K32-1%50ppm
R2	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R3	24811/208	RESISTOR-FIXED METAL-FILM 30K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-30K1-1%50ppm
R4	24811/642	RESISTOR-FIXED METAL-FILM 7K5 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-7K5-0.1%-15
R5	24811/640	RESISTOR-FIXED METAL-FILM 1K54 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K54-0.1%-15
R6	24811/218	RESISTOR-FIXED METAL-FILM 75K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75K-1%50ppm
R7	24811/642	RESISTOR-FIXED METAL-FILM 7K5 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-7K5-0.1%-15
R8	24811/640	RESISTOR-FIXED METAL-FILM 1K54 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K54-0.1%-15
R9	24811/218	RESISTOR-FIXED METAL-FILM 75K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75K-1%50ppm
R10	24811/641	RESISTOR-FIXED METAL-FILM 2K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K0-0.1%-15
R11	24811/641	RESISTOR-FIXED METAL-FILM 2K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K0-0.1%-15
R12	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R13	24811/637	RESISTOR-FIXED METAL-FILM 392R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-392R-0.1%-15
R14	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R15	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R16	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R17	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm

A3 Audio processor 1 (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R18	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R19	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R20	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R21	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R22	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R23	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R24	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R25	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R26	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R27	24811/133	RESISTOR-FIXED METAL-FILM 22R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22R1-1%50ppm
R30	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R31	24811/244	RESISTOR-FIXED METAL-FILM 909K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-909K-1%50ppm
R32	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R33	24811/196	RESISTOR-FIXED METAL-FILM 9K09 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-9K09-1%50ppm
R34	24811/211	RESISTOR-FIXED METAL-FILM 39K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-39K2-1%50ppm
R35	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R36	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R37	24811/143	RESISTOR-FIXED METAL-FILM 56R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56R2-1%50ppm
R38	24811/239	RESISTOR-FIXED METAL-FILM 562K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562K-1%50ppm
R39	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R40 to R44	24811/156	RESISTOR-FIXED METAL-FILM 200R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-200R-1%50ppm
R45	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R46	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R47	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R48	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R49	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm

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Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R50	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R51	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R52	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R53	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R54 to R59	24811/238	RESISTOR-FIXED METAL-FILM 511K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511K-1%50ppm
R60	24811/212	RESISTOR-FIXED METAL-FILM 43K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-43K2-1%50ppm
R61	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R62	24811/133	RESISTOR-FIXED METAL-FILM 22R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22R1-1%50ppm
R65	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R66	24811/244	RESISTOR-FIXED METAL-FILM 909K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-909K-1%50ppm
R67	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R68	24811/196	RESISTOR-FIXED METAL-FILM 9K09 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-9K09-1%50ppm
R69	24811/215	RESISTOR-FIXED METAL-FILM 56K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56K2-1%50ppm
R70	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R71	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R72	24811/143	RESISTOR-FIXED METAL-FILM 56R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56R2-1%50ppm
R73	24811/239	RESISTOR-FIXED METAL-FILM 562K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562K-1%50ppm
R74	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R75 to R79	24811/156	RESISTOR-FIXED METAL-FILM 200R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-200R-1%50ppm
R80	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R81	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R82	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R83	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R84	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R85	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R86	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm

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Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R87	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R88	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R89	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R90	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R91	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R92	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R93	24811/170	RESISTOR-FIXED METAL-FILM 750R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-750R-1%50ppm
R95	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R96	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R97	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R98	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R99	24811/101	RESISTOR-FIXED METAL-FILM 1R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1R-1%-50ppm
R101	24811/176	RESISTOR-FIXED METAL-FILM 1K3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K3-1%50ppm
R106	24811/217	RESISTOR-FIXED METAL-FILM 68K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68K1-1%50ppm
R107	24811/208	RESISTOR-FIXED METAL-FILM 30K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-30K1-1%50ppm
R108	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R109	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R110	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R111	24811/234	RESISTOR-FIXED METAL-FILM 365K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-365K-1%50ppm
R112	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R114	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R117	24811/184	RESISTOR-FIXED METAL-FILM 3K01 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K01-1%50ppm
R118	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R119	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R120	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R121	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
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R122	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R123	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R124	24811/101	RESISTOR-FIXED METAL-FILM 1R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1R-1%-50ppm
R126	24811/176	RESISTOR-FIXED METAL-FILM 1K3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K3-1%50ppm
R131	24811/217	RESISTOR-FIXED METAL-FILM 68K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68K1-1%50ppm
R132	24811/208	RESISTOR-FIXED METAL-FILM 30K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-30K1-1%50ppm
R133	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R134	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R137	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R139	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R142	24811/184	RESISTOR-FIXED METAL-FILM 3K01 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K01-1%50ppm
R143	24811/172	RESISTOR-FIXED METAL-FILM 909R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-909R-1%50ppm
R144	24811/208	RESISTOR-FIXED METAL-FILM 30K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-30K1-1%50ppm
R145	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R146	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R147	24811/192	RESISTOR-FIXED METAL-FILM 6K19 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K19-1%50ppm
R148	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R149	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R150	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R151	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R152	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R153	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R154	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R155	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R157	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R159	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm

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Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R160 to R163	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R164 to R167	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R168	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R169 to R175	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R176	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R177	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R178	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R179	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R185	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R186	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R187	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R188	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R189	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R190 to R196	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R197	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R198	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R200 to R207	24338/004	RESISTOR-FIXED METAL-GLAZE 150R +/- 5% 1W 100V 350 ppm/DEG.C, SURFACE MOUNTED, SIZE 2512, (12mm	VISHAY COMPONENTS	CR2512-150R-5%-P4
R208 to R214	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R215 to R218	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R221	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R222 to R225	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R226	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R227	24811/207	RESISTOR-FIXED METAL-FILM 27K4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27K4-1%50ppm
R228	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R229	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R230	24811/207	RESISTOR-FIXED METAL-FILM 27K4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27K4-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A3 Audio processor 1 (contd.)				
R231	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
RLA to RLF	23486/166	RELAY MAGNETIC, DOUBLE-POLE CHANGEOVER, 12V COIL, 720R - CONTACTS 1A, 125V, MAX LOAD 30W, PCB	FUJITSU LTD	FBR46-N-D012-P
TR1 to TR4	28459/079	TRANSISTOR N-CHANNEL-ENHANCE MOSFET SST211... 10V 350mW 50mA 75R ON 1nS, OFF 2nS, MARKING CODE D1**,	TEMIC UK LTD	SST211-T1
TR5	28487/811	TRANSISTOR NPN BIPOLAR BC818-40... 25V 170MHz 330mW 500mA 250hFE MIN @ 100mA, MARKING CODE 6G,	PHILIPS	BC818-40
TR6 to TR10	28487/811	TRANSISTOR NPN BIPOLAR BC818-40... 25V 170MHz 330mW 500mA 250hFE MIN @ 100mA, MARKING CODE 6G,	PHILIPS	BC818-40

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number

A4 PPH, RTP and TTP

When ordering, prefix circuit reference with A4.

	44829-834	Complete unit	Issue 10	
C2	26451/010	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-101P
C3	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C4	26451/008	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-470P
C5	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C6	26451/010	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-101P
C7	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C8	26451/008	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-470P
C9 to C112	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C113 to C115	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C116 to C120	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C121	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C122	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C123 to C136	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C137	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
IC1	28469/049	IC-DIGITAL TRANSCEIVER 74HCT245... OCTAL, BI-DIRECTIONAL, TRI-STATE BUS, CMOS-H/SPEED+TTL,	PHILIPS	74HCT245D
IC2	28467/096	IC-MICRO PROCESSOR, 16 BIT, 68000... 10MHz, CHMOS, 68 PIN, PLCC.	SGS-THOMSON	EF68000/FN/10
IC3	28469/049	IC-DIGITAL TRANSCEIVER 74HCT245... OCTAL, BI-DIRECTIONAL, TRI-STATE BUS, CMOS-H/SPEED+TTL,	PHILIPS	74HCT245D
IC4	28471/065	IC-MICRO EEPROM, 128K x 8 BIT, 29F010... 90nS, 5V ONLY, FLASH MEMORY, 1000 ERASE/PROGRAMME CYCLES,	ADVANCED MICRO DEV	AM29F010-90JC
IC5	28467/117	IC-MICRO STATIC-RAM, 128K x 8 BIT, HM628128... 5V, 100nS, 50uA MAX STANDBY CURRENT, CMOS, 32 PIN,	TOSHIBA (UK) LTD	TC551001BFL-10L
IC6	44535/309	IC-PROGRAMMED PAL, SET OF 1, 2965, A4 PPH DECODER.	MARCONI INSTRUMENTS LTD	
IC7	28469/607	IC-DIGITAL FIELDPROG-GATE-ARRAY XC3030... 3000 GATES, 100 LOGIC BLOCKS, 80 INPUT/OUTPUTS, ZERO	XILINX (USA)	XC3030-100PQ100C
IC8	28471/065	IC-MICRO EEPROM, 128K x 8 BIT, 29F010... 90nS, 5V ONLY, FLASH MEMORY, 1000 ERASE/PROGRAMME CYCLES,	ADVANCED MICRO DEV	AM29F010-90JC
IC9	28467/117	IC-MICRO STATIC-RAM, 128K x 8 BIT, HM628128... 5V, 100nS, 50uA MAX STANDBY CURRENT, CMOS, 32 PIN,	TOSHIBA (UK) LTD	TC551001BFL-10L

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A4 PPH, RTP and TTP (contd.)				
IC10	28467/101	IC-MICRO CONTROLLER, 82C54... PROGRAMMABLE INTERVAL TIMER, 8MHz, CMOS, 28 PIN, PLCC.	HARRIS SEMICONDUCTOR	CS82C54
IC11	28467/159	IC-MICRO DIGIT/SGNL PROCESSR, ADSP2115... 16.7MHz, DIGITAL SIGNAL PROCESSING, 1K PROGRAM & 512 WORD	ANALOG DEVICES LTD	ADSP-2115KP-66
IC12	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)
IC13	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)
IC14	28467/156	IC-MICRO STATIC-RAM, 8K x 8 BIT, KM6865B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT7164S-15Y(TUBE)
IC15	44535/311	IC-PROGRAMMED PAL, SET OF 1, 2965, A4 DECFAST.	MARCONI INSTRUMENTS LTD	
IC16	44535/310	IC-PROGRAMMED PAL, SET OF 1, 2965, A4 BR TXR.	MARCONI INSTRUMENTS LTD	
IC17	28467/159	IC-MICRO DIGIT/SGNL PROCESSR, ADSP2115... 16.7MHz, DIGITAL SIGNAL PROCESSING, 1K PROGRAM & 512 WORD	ANALOG DEVICES LTD	ADSP-2115KP-66
IC18	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)
IC19	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)
IC20	28467/156	IC-MICRO STATIC-RAM, 8K x 8 BIT, KM6865B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT7164S-15Y(TUBE)
IC21	44535/311	IC-PROGRAMMED PAL, SET OF 1, 2965, A4 DECFAST.	MARCONI INSTRUMENTS LTD	
IC22	44535/310	IC-PROGRAMMED PAL, SET OF 1, 2965, A4 BR TXR.	MARCONI INSTRUMENTS LTD	
IC23	28469/028	IC-DIGITAL BUFFER/LINE-DRIVER 74HCT244... OCTAL, NON-INVERTING, TRI-STATE BUS, CMOS-H/SPEED+TTL, 20	PHILIPS	74HCT244D
IC24	28469/052	IC-DIGITAL BUFFER 74HC365... HEX, TRI-STATE, NON-INVERTING, CMOS-H/SPEED, 16 PIN,	PHILIPS	74HC365D
IC25	28469/769	IC-DIGITAL MULTIPLEXER 74AC157... 2 INPUT, 4 BIT, SINGLE, NON-INVERTING DATA-SELECTION,	NAT. SEMICONDUCTOR	74AC157SC
IC26	28465/053	IC-DIGITAL DECODER/DEMULTIPLEX 74HCT138... 3 INPUT, 8 BIT, SINGLE, INVERTING, 3 BIT ADDRESS,	PHILIPS	74HCT138D
IC27	28469/030	IC-DIGITAL BUFFER/LINE-DRIVER 74HCT541... OCTAL, TRI-STATE, NON-INVERTING, CMOS-H/SPEED+TTL, 20	PHILIPS	74HCT541D
IC28	28469/099	IC-DIGITAL TRANSCEIVER/REGISTER 74FCT652... OCTAL, TRI-STATE, NON-INVERTING, CMOS-FAST+TTL, 24 PIN,	HARRIS SEMICONDUCTOR	CD74FCT652M
IC29	28469/099	IC-DIGITAL TRANSCEIVER/REGISTER 74FCT652... OCTAL, TRI-STATE, NON-INVERTING, CMOS-FAST+TTL, 24 PIN,	HARRIS SEMICONDUCTOR	CD74FCT652M
IC30	28465/053	IC-DIGITAL DECODER/DEMULTIPLEX 74HCT138... 3 INPUT, 8 BIT, SINGLE, INVERTING, 3 BIT ADDRESS,	PHILIPS	74HCT138D
IC31	28466/029	IC-DIGITAL AND-GATE 74HCT21... 4 INPUT, DUAL, CMOS-H/SPEED+TTL, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HCT21D
L1	23642/801	FILTER RFI-SUPPRESSION, 3A RATING, SURFACE MOUNT, MULTILAYER IMPEDER, 95R IMPEDANCE @ 10MHz, 0.04R	TDK UK LTD	HF50ACC-575032-T

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A4 PPH, RTP and TTP (contd.)				
PLA	23437/061	CONNECTOR MULTIWAY, PCB HEADER, 10 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD10RP
PLB	23437/064	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD20RP
PLC	23437/062	CONNECTOR MULTIWAY, PCB HEADER, 14 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD14RP
PLD	23437/063	CONNECTOR MULTIWAY, PCB HEADER, 16 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD16RP
PLE	23437/061	CONNECTOR MULTIWAY, PCB HEADER, 10 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD10RP
PLF	23437/064	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD20RP
PLG	23437/064	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD20RP
PLH	23437/062	CONNECTOR MULTIWAY, PCB HEADER, 14 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD14RP
PLN	23437/064	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD20RP
PLW	23437/062	CONNECTOR MULTIWAY, PCB HEADER, 14 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD14RP
PLAQ	23437/069	CONNECTOR MULTIWAY, PCB HEADER, 50 WAY, STRAIGHT, 2-ROW, 2mm GRID, STACKABLE, SURFACE MOUNTING, PINS	MOLEX ELECTRONICS	87267-5050
PLJK	23437/064	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD20RP
R101 to R103	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R104	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R107	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R108	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R109	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R111	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R112	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R113	24811/228	RESISTOR-FIXED METAL-FILM 200K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-200K-1%50ppm
R115	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R116	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R117	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R118	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm

A4 PPH, RTP and TTP (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R119	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R120	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R121 to R130	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R201	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R202	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R203 to R207	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R209	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R210	24681/549	RESISTOR-NETWORK BUSSED, THICK-FILM, 22K 2% 600mW 50V 200 ppm/DEG.C, 15 RESISTORS, SURFACE MOUNTED,	VISHAY COMPONENTS	SOMC16-01-223-G-TUBE
R211	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R301	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R302	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R303 to R306	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R307	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R308	24681/549	RESISTOR-NETWORK BUSSED, THICK-FILM, 22K 2% 600mW 50V 200 ppm/DEG.C, 15 RESISTORS, SURFACE MOUNTED,	VISHAY COMPONENTS	SOMC16-01-223-G-TUBE
R309	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R310 to R312	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R313	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R314 to R320	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R321	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R322	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R323	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R401	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R402	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R403 to R406	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R407	24681/549	RESISTOR-NETWORK BUSSED, THICK-FILM, 22K 2% 600mW 50V 200 ppm/DEG.C, 15 RESISTORS, SURFACE MOUNTED,	VISHAY COMPONENTS	SOMC16-01-223-G-TUBE
R408	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm

A4 PPH, RTP and TTP (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R409	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R410 to R412	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R413	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R414 to R420	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R421	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R422 to R501	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R502 to R504	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R505 to R507	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R508 to R510	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R511	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R512	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R513 to R516	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R517	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
SKA	23445/502	CONNECTOR-RF MMCX-TYPE FEMALE, JACK, 50 OHMS, SURFACE MOUNTING, HORIZONTAL, DC-6GHz, GOLD PLATD	HUBER & SUHNER	85MMCX-S50-0-51
SKB	23445/502	CONNECTOR-RF MMCX-TYPE FEMALE, JACK, 50 OHMS, SURFACE MOUNTING, HORIZONTAL, DC-6GHz, GOLD PLATD	HUBER & SUHNER	85MMCX-S50-0-51

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number

A5 Display

When ordering, prefix circuit reference with A5.

	44829-835	Complete unit	Issue 34	
C1 to C5	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C6	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C7 to C12	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C13	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C14	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C15	26386/832	CAPACITOR-FIXED CERAMIC 470pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-471-JP
C16	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C17	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C18	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C19 to C22	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C23	26386/832	CAPACITOR-FIXED CERAMIC 470pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-471-JP
C24	26386/759	CAPACITOR-FIXED CERAMIC 22nF +/-20% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	PHILIPS	1206-2R-223-K9-BBC
C25	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C26	26386/832	CAPACITOR-FIXED CERAMIC 470pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-471-JP
C27 to C29	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C30	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C31 to C33	26386/823	CAPACITOR-FIXED CERAMIC 82pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-820-JP
C34	26386/817	CAPACITOR-FIXED CERAMIC 27pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-270-JP
C35	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C36	26386/809	CAPACITOR-FIXED CERAMIC 5.6pF +/-0.5pF 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-5R6-DP
C37	26538/576	CAPACITOR-FIXED POLYSTYRENE 160pF +/-1% 63V 150 ppm/DEG.C, RADIAL, 7.6mm PWP, (LOOSE OR TAPED).	LCR COMPONENTS	EP9-160pF-1%-63V
C38	26538/576	CAPACITOR-FIXED POLYSTYRENE 160pF +/-1% 63V 150 ppm/DEG.C, RADIAL, 7.6mm PWP, (LOOSE OR TAPED).	LCR COMPONENTS	EP9-160pF-1%-63V
C39	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C40	26386/828	CAPACITOR-FIXED CERAMIC 220pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-221-JP

A5 Display (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
C41	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C42	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C43	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C44	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C45	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C47	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C48	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C49	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C50	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C51 to C54	26582/428	CAPACITOR-FIXED POLYESTER 47nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1817-347/065TA18
C55	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C56	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C57	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C58	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C59	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C60	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C61	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C62	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C63	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C64	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C65	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C66	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C67	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C68 to C71	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C72	26343/913	CAPACITOR-FIXED CERAMIC 560pF +/-1% 63V NP0 MULTILAYER, RADIAL, 5.08mm PWP, (LOOSE OR TAPED).	AVX LTD	SR21-5A-561-FAA
C73	26343/913	CAPACITOR-FIXED CERAMIC 560pF +/-1% 63V NP0 MULTILAYER, RADIAL, 5.08mm PWP, (LOOSE OR TAPED).	AVX LTD	SR21-5A-561-FAA

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A5 Display (contd.)				
C74	26538/630	CAPACITOR-FIXED POLYSTYRENE 680pF +/-2% 63V 150 ppm/DEG.C, RADIAL, 7.6mm PWP, (TAPED).	LCR COMPONENTS	EP9-680pF-2%-63V
C75	26538/603	CAPACITOR-FIXED POLYSTYRENE 330pF +/-2% 63V 150 ppm/DEG.C, RADIAL, 7.6mm PWP, (LOOSE OR TAPED).	LCR COMPONENTS	EP9-330pF-2%-63V
C76	26538/910	CAPACITOR-FIXED POLYSTYRENE 2.2nF +/-1% 63V 125 ppm/DEG.C, RADIAL, 5.08mm PWP, SQUARE, WIRES ON	LCR COMPONENTS	EXFS/HR-2200pF-63V
C77	26538/571	CAPACITOR-FIXED POLYSTYRENE 150pF +/-2% 63V 150 ppm/DEG.C, RADIAL, 7.6mm PWP, (TAPED).	LCR COMPONENTS	EP9-150pF-2%-63V
C78	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C79	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C101 to C172	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
D3	28355/168	DIODE RECTIFIER, SCHOTTKY, 1N5818... 30V 1A 0.55Vf @ 1A, AXIAL, DO-41, (TAPED).	MOTOROLA INC.	1N5818
D4	28355/168	DIODE RECTIFIER, SCHOTTKY, 1N5818... 30V 1A 0.55Vf @ 1A, AXIAL, DO-41, (TAPED).	MOTOROLA INC.	1N5818
D5	28381/132	DIODE VARIABLE CAPACITNCE, BB809... 28V 20mA 29pF @ 3V, CAPAC RATIO 5.0 MIN, AXIAL, DO-34, (TAPED).	PHILIPS	BB809
D6	28349/022	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2812... DUAL, 20V 1.2pF 410mVf @ 1mA, IN SERIES, MARKING CODE	HEWLETT-PACKARD	HSMS-2812-L31
D7	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D8	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D9	28349/029	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2810... 20V 1.2pF 410mVf @ 1mA, MARKNG CODE B0, LOW PROFILE,	HEWLETT-PACKARD	HSMS-2810-L31
D10 to D16	28624/136	LED RED, SIZE T1, 3mm DIA, HLMP-1301... 2.4 Vf TYP, 90 mA If MAX, 2.5 mcd @ 10mA - 60 DEG,	HEWLETT-PACKARD	HLMP-1301
IC1	44535/250	IC-PROGRAMMED PAL, SET OF 1, 2965, A5 BLANKING LOGIC.		
IC2	28469/051	IC-DIGITAL INVERTER 74AC04... HEX, CMOS-ADVANCED, 14 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	74AC04SC
IC3	28467/099	IC-MICRO GRAPHICS, 476... COLOUR PALETTE, 256 x 18 RAM, SINGLE, RS343A/RS170 OUTPUTS, STANDARD MPU	ANALOG DEVICES LTD	ADV476KP35
IC4	28467/099	IC-MICRO GRAPHICS, 476... COLOUR PALETTE, 256 x 18 RAM, SINGLE, RS343A/RS170 OUTPUTS, STANDARD MPU	ANALOG DEVICES LTD	ADV476KP35
IC5	28461/397	IC-ANALOGUE OPERATIONAL AMP EL2020C... SLEW RATE 300V/uS MIN, CURRENT-FEEDBACK, 8 PIN,	ELANTEC INC	EL2020CN
IC6	28469/069	IC-DIGITAL TRANSCEIVER 74ACT245... OCTAL, TRI-STATE, NON-INVERTING, BI-DIRECTIONAL,	NAT. SEMICONDUCTOR	74ACT245SC
IC7	28467/063	IC-MICRO GRAPHICS, A82786... CO-PROCESSOR, 25MHz, 88 PIN, PIN-GRID-ARRAY.	INTEL CORP (UK) LTD	A82786-SX365
IC8 to IC11	28469/337	IC-MICRO DYNAMIC-RAM, 256K x 4BIT, 514256... 100nS ACCESS TIME, 1mA STANDBY CURRENT, CMOS, 26 PIN,	TOSHIBA (UK) LTD	TC514256BJ-10

A5 Display (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
IC12	28469/069	IC-DIGITAL TRANSCEIVER 74ACT245... OCTAL, TRI-STATE, NON-INVERTING, BI-DIRECTIONAL,	NAT. SEMICONDUCTOR	74ACT245SC
IC13	28467/096	IC-MICRO PROCESSOR, 16 BIT, 68000... 10MHz, CHMOS, 68 PIN, PLCC.	SGS-THOMSON	EF68000/FN/10
IC14	28467/117	IC-MICRO STATIC-RAM, 128K x 8 BIT, HM628128... 5V, 100nS, 50uA MAX STANDBY CURRENT, CMOS, 32 PIN,	TOSHIBA (UK) LTD	TC551001BFL-10L
IC15	28469/559	IC-DIGITAL FIELDPROG-GATE-ARRAY XC2064... 1200 GATES, 64 LOGIC BLOCKS, 58 INPUT/OUTPUTS, ZERO RAM	XILINX (USA)	XC2064-70PC68C
IC16	28469/559	IC-DIGITAL FIELDPROG-GATE-ARRAY XC2064... 1200 GATES, 64 LOGIC BLOCKS, 58 INPUT/OUTPUTS, ZERO RAM	XILINX (USA)	XC2064-70PC68C
IC18	28469/072	IC-DIGITAL INVERTER 74AC05... HEX, OPEN COLLECTOR, CMOS-ADVANCED, 14 PIN, DUAL-IN-LINE.	HARRIS SEMICONDUCTOR	CD74AC05E
IC19	28467/117	IC-MICRO STATIC-RAM, 128K x 8 BIT, HM628128... 5V, 100nS, 50uA MAX STANDBY CURRENT, CMOS, 32 PIN,	TOSHIBA (UK) LTD	TC551001BFL-10L
IC21	28464/173	IC-DIGITAL COUNTER 74AC161... 4 INPUT, 4 BIT, SINGLE, BINARY, SYNCHRONOUS, PRESETTABLE + RESET,	NAT. SEMICONDUCTOR	74AC161SC
IC22	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC23	28469/053	IC-ANALOGUE BUFFER-AMPLIFIER EL2001... 18V UNITY GAIN, SLEW-RATE 1200 V/uS MIN, BANDWIDTH 70MHz @	ELANTEC INC	EL2001CN
IC24	28461/817	IC-ANALOGUE A/D CONVERTER MP7684... SINGLE, 5V 8 BIT, BUFFERED FLASH CONVERTER, CMOS, 28 PIN,	HARRIS SEMICONDUCTOR	HI3-5700J-5
IC25	28462/639	IC-DIGITAL FLIP-FLOP/D-TYPE 74AC374... OCTAL, NON-INVERTING, POS EDGE TRIGGER, TRI-STATE,	NAT. SEMICONDUCTOR	74AC374SC
IC26	28469/555	IC-DIGITAL FIELDPROG-GATE-ARRAY XC3030... 3000 GATES, 100 LOGIC BLOCKS, 74 INPUT/OUTPUTS, ZERO	XILINX (USA)	XC3030-100PC84C
IC28	28469/534	IC-DIGITAL REGISTER CY7C421... 9 BIT, SINGLE, FIFO 512 WORD, ASYNCHRONOUS MODE, TRI-STATE OUTPUTS,	ADVANCED MICRO DEV	AM7201-50JC
IC29	28469/070	IC-DIGITAL BUFFER/LINE-DRIVER 74ACT240... OCTAL, TRI-STATE, INVERTING, CMOS-ADVANCED+TTL, 20 PIN,	NAT. SEMICONDUCTOR	74ACT240SC
IC30	28469/534	IC-DIGITAL REGISTER CY7C421... 9 BIT, SINGLE, FIFO 512 WORD, ASYNCHRONOUS MODE, TRI-STATE OUTPUTS,	ADVANCED MICRO DEV	AM7201-50JC
IC31	28469/070	IC-DIGITAL BUFFER/LINE-DRIVER 74ACT240... OCTAL, TRI-STATE, INVERTING, CMOS-ADVANCED+TTL, 20 PIN,	NAT. SEMICONDUCTOR	74ACT240SC
IC32	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
IC33	28467/126	IC-MICRO CONTROLLER, 82C54... PROGRAMMABLE INTERVAL TIMER, 12.5MHz, CMOS, 28 PIN, PLCC.		
IC34	28461/874	IC-ANALOGUE SWITCH DG411... QUAD, 15V SPST, ON-RESISTANCE<35R, 4 x N/O @ LOGIC 1, TTL	ANALOG DEVICES LTD	ADG411BR
IC35	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC36	28461/813	IC-ANALOGUE FILTER LTC1064... QUAD, SWITCHED CAPACITOR, ACTIVE, CLOCK FREQUENCY 7MHz TYP, CMOS,	LINEAR TECHNOLOGY	LTC1064CS
IC37	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC38	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC39	28461/814	IC-ANALOGUE A/D CONVERTER AD7870... 5V 12 BIT, WITH ON CHIP REFERENCE, TRACK/HOLD AMP AND	ANALOG DEVICES LTD	AD7870LN
IC40	28467/118	IC-MICRO STATIC-RAM, 32K x 8 BIT, 62256... 100nS, 100uA STANDBY CURRENT, 0.45in PITCH, CMOS, 28 PIN,	TOSHIBA (UK) LTD	TC55257BFL-10

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A5 Display (contd.)				
IC41	28467/118	IC-MICRO STATIC-RAM, 32K x 8 BIT, 62256... 100nS, 100uA STANDBY CURRENT, 0.45in PITCH, CMOS, 28 PIN,	TOSHIBA (UK) LTD	TC55257BFL-10
IC42	28467/120	IC-MICRO DIGIT/SGNL PROCESSR, ADSP2101... 10MHz, DIGITAL SIGNAL PROCESSING, 2K PROGRAM & 0.5K DATA	ANALOG DEVICES LTD	ADSP2101KP-40 REV3+
IC43	28469/559	IC-DIGITAL FIELDPROG-GATE-ARRAY XC2064... 1200 GATES, 64 LOGIC BLOCKS, 58 INPUT/OUTPUTS, ZERO RAM	XILINX (USA)	XC2064-70PC68C
IC44	28469/028	IC-DIGITAL BUFFER/LINE-DRIVER 74HCT244... OCTAL, NON-INVERTING, TRI-STATE BUS, CMOS-H/SPEED+TTL, 20	PHILIPS	74HCT244D
IC45	28469/028	IC-DIGITAL BUFFER/LINE-DRIVER 74HCT244... OCTAL, NON-INVERTING, TRI-STATE BUS, CMOS-H/SPEED+TTL, 20	PHILIPS	74HCT244D
IC46	28469/070	IC-DIGITAL BUFFER/LINE-DRIVER 74ACT240... OCTAL, TRI-STATE, INVERTING, CMOS-ADVANCED+TTL, 20 PIN,	NAT. SEMICONDUCTOR	74ACT240SC
IC47	28469/436	IC-ANALOGUE D/A-CONVERTER 7545... 15V 12 BIT, BUFFERED, MULTIPLYING, REL-ACC +/-2 LSB, GAIN-ERR	ANALOG DEVICES LTD	AD7545JN
IC48	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC49	28461/413	IC-ANALOGUE OPERATIONAL AMP TL074... QUAD, JFET INPUT, LOW NOISE, SLEW RATE 8V/uS MIN, GAIN	MOTOROLA INC.	TL074CD
IC50	28461/803	IC-ANALOGUE VOLTAGE-REFERENCE LT1019... 5V PRECISION, OUTPUT VOLTAGE DRIFT 20ppm/DEG.C MAX,	LINEAR TECHNOLOGY	LT1019CS8-5
IC51	28462/141	IC-DIGITAL FLIP-FLOP/D-TYPE 74HCT377... OCTAL, POS EDGE TRIGGER WITH DATA ENABLE, CMOS-H/SPEED+TTL,	PHILIPS	74HCT377D
IC52	28462/141	IC-DIGITAL FLIP-FLOP/D-TYPE 74HCT377... OCTAL, POS EDGE TRIGGER WITH DATA ENABLE, CMOS-H/SPEED+TTL,	PHILIPS	74HCT377D
IC53	28461/804	IC-ANALOGUE D/A-CONVERTER DAC-312... SINGLE, 12 BIT, HIGH SPEED MULTIPLYING, BIPOLAR, 20 PIN,	ANALOG DEVICES LTD	DAC-312HS
IC54	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC55	28461/741	IC-ANALOGUE VOLTAGE-REGULATOR LM317L... 37V 100mA POSITIVE ADJUSTABLE, LINEAR, MONOLITHIC, 3 PIN,	NAT. SEMICONDUCTOR	LM317LZ
IC56	28461/748	IC-ANALOGUE VOLTAGE-REGULATOR LM337L... 37V 100mA NEGATIVE ADJUSTABLE, LINEAR, MONOLITHIC, 3 PIN,	NAT. SEMICONDUCTOR	LM337LZ
IC57	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC58	28461/762	IC-ANALOGUE VOLTAGE-REFERENCE LM385... SINGLE, 1.2V 8uA LINEAR, MONOLITHIC, 8 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	LM385M-1.2
IC59	28461/762	IC-ANALOGUE VOLTAGE-REFERENCE LM385... SINGLE, 1.2V 8uA LINEAR, MONOLITHIC, 8 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	LM385M-1.2
IC60	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
L1	23642/909	WOUND-PART INDUCTOR, WIDEBAND HF CHOKE, BEAD-CORE, 4B1 GRADE MATERIAL, 2.5 TURNS, TINNED COPPER WIRE.	PHILIPS	4312-020-36700
L2	23642/909	WOUND-PART INDUCTOR, WIDEBAND HF CHOKE, BEAD-CORE, 4B1 GRADE MATERIAL, 2.5 TURNS, TINNED COPPER WIRE.	PHILIPS	4312-020-36700
L3	23642/512	INDUCTOR-FIXED 22uH +/- 5% EPOXY-MOULD, 110mA 3R7 MAX, 30 Q @ 2.5 MHz, 25 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-220-J
L4	23642/510	INDUCTOR-FIXED 0.1uH +/- 5% EPOXY-MOULD, 450mA 0R44 MAX, 28 Q @ 100 MHz, 700 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R10-J

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A5 Display (contd.)				
L5	23642/510	INDUCTOR-FIXED 0.1uH +/- 5% EPOXY-MOULD, 450mA 0R44 MAX, 28 Q @ 100 MHz, 700 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R10-J
L6	23642/561	INDUCTOR-FIXED 100uH +/- 10% COATED-LACQUER, MINIATURE, 140mA 11R MAX, 50 Q @ 2.5 MHz, 7 MHz	MEGGITT ELECTRONICS	C12-406/8/27471/004
L7	23642/561	INDUCTOR-FIXED 100uH +/- 10% COATED-LACQUER, MINIATURE, 140mA 11R MAX, 50 Q @ 2.5 MHz, 7 MHz	MEGGITT ELECTRONICS	C12-406/8/27471/004
L8 to L11	23642/909	WOUND-PART INDUCTOR, WIDEBAND HF CHOKE, BEAD-CORE, 4B1 GRADE MATERIAL, 2.5 TURNS, TINNED COPPER WIRE.	PHILIPS	4312-020-36700
L12	23642/517	INDUCTOR-FIXED 0.047uH +/- 5% EPOXY-MOULD, 450mA 0R3 MAX, 26 Q @ 100 MHz, 1.2K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-047-J
L13	23642/510	INDUCTOR-FIXED 0.1uH +/- 5% EPOXY-MOULD, 450mA 0R44 MAX, 28 Q @ 100 MHz, 700 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R10-J
PLA to PLH	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLJ	23436/900	CONNECTOR MULTIWAY, PCB HEADER, 10 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7108
PLK	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLL	23435/950	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7208
PLM	23436/900	CONNECTOR MULTIWAY, PCB HEADER, 10 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7108
PLN to PLQ	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
R1 to R3	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R4	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R5	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R6	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R7	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R8	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R9	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R10	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R11	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R12	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R17 to R21	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A5 Display (contd.)				
R22 to R24	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R26	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R27	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R28	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R30	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R31	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R32	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R33	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R34	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R35	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R36	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R37	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R38	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R39	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R40	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R41	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R42	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R43	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R44	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R45	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R46	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R47	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R48	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R49	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R50 to R53	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R54	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A5 Display (contd.)				
R55	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R56	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R57	24811/210	RESISTOR-FIXED METAL-FILM 36K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-36K5-1%50ppm
R58	24811/192	RESISTOR-FIXED METAL-FILM 6K19 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K19-1%50ppm
R59	24811/208	RESISTOR-FIXED METAL-FILM 30K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-30K1-1%50ppm
R60	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R61	24811/630	RESISTOR-FIXED METAL-FILM 93K1 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-93K1-0.1%-15
R62	24811/628	RESISTOR-FIXED METAL-FILM 90K9 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-90K9-0.1%-15
R63	24811/620	RESISTOR-FIXED METAL-FILM 10K7 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K7-0.1%-15
R64	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R65	24811/622	RESISTOR-FIXED METAL-FILM 11K3 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-11K3-0.1%-15
R66	24811/627	RESISTOR-FIXED METAL-FILM 26K7 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-26K7-0.1%-15
R67	24811/623	RESISTOR-FIXED METAL-FILM 12K1 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-0.1%-15
R68	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R69	24811/626	RESISTOR-FIXED METAL-FILM 25K5 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-25K5-0.1%-15
R70	24811/601	RESISTOR-FIXED METAL-FILM 33K2 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-0.1%-15
R71	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R72	24811/629	RESISTOR-FIXED METAL-FILM 34K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-34K0-0.1%-15
R73	24811/625	RESISTOR-FIXED METAL-FILM 14K7 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-14K7-0.1%-15
R74	24811/607	RESISTOR-FIXED METAL-FILM 20K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-20K0-0.1%-15
R75	24811/631	RESISTOR-FIXED METAL-FILM 95K3 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-95K3-0.1%-15
R76	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R77	24811/626	RESISTOR-FIXED METAL-FILM 25K5 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-25K5-0.1%-15
R78	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R79	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R80 to R84	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A5 Display (contd.)				
R85	24681/528	RESISTOR-NETWORK ISOLATED, THICK-FILM, 10K 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	SOMC16-03-103-G-REEL
R86	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R87 to R89	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R90	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R94 to R97	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R98	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R99	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R100	24811/204	RESISTOR-FIXED METAL-FILM 20K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20K-1%50ppm
R101	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R102	24811/195	RESISTOR-FIXED METAL-FILM 8K25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K25-1%50ppm
R103	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R104	24811/232	RESISTOR-FIXED METAL-FILM 301K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301K-1%50ppm
R105	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R106	24811/228	RESISTOR-FIXED METAL-FILM 200K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-200K-1%50ppm
R107	24811/223	RESISTOR-FIXED METAL-FILM 121K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-121K-1%50ppm
R108	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R109	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R110	24811/212	RESISTOR-FIXED METAL-FILM 43K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-43K2-1%50ppm
R111	24811/195	RESISTOR-FIXED METAL-FILM 8K25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K25-1%50ppm
R112	24811/204	RESISTOR-FIXED METAL-FILM 20K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20K-1%50ppm
R113	24811/209	RESISTOR-FIXED METAL-FILM 33K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-1%50ppm
R114	24811/204	RESISTOR-FIXED METAL-FILM 20K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20K-1%50ppm
R115	24811/209	RESISTOR-FIXED METAL-FILM 33K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-1%50ppm
R116	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R117	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm
R118	24811/190	RESISTOR-FIXED METAL-FILM 5K11 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K11-1%50ppm

A5 Display (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R119	24811/619	RESISTOR-FIXED METAL-FILM 2K55 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K55-0.1%-15
R120	24811/619	RESISTOR-FIXED METAL-FILM 2K55 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K55-0.1%-15
R121	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R122	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R123	24811/158	RESISTOR-FIXED METAL-FILM 243R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-243R-1%50ppm
R124	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R125	24811/158	RESISTOR-FIXED METAL-FILM 243R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-243R-1%50ppm
R126	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R127	24811/621	RESISTOR-FIXED METAL-FILM 11K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-11K0-0.1%-15
R128	24811/621	RESISTOR-FIXED METAL-FILM 11K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-11K0-0.1%-15
R129	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R130	24811/624	RESISTOR-FIXED METAL-FILM 13K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-13K0-0.1%-15
R131	24811/624	RESISTOR-FIXED METAL-FILM 13K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-13K0-0.1%-15
R132	24811/206	RESISTOR-FIXED METAL-FILM 24K3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-24K3-1%50ppm
R133	24811/621	RESISTOR-FIXED METAL-FILM 11K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-11K0-0.1%-15
R134	24811/621	RESISTOR-FIXED METAL-FILM 11K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-11K0-0.1%-15
R135	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R141 to R143	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R144 to R147	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R148	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R149	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R150	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R151	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R152	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R153	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R154	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A5 Display (contd.)				
R155 to R162	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R163	24811/219	RESISTOR-FIXED METAL-FILM 82K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-82K5-1%50ppm
R164 to R166	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R167	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
TR1	28452/167	TRANSISTOR NPN BIPOLAR BFR90... 15V 5GHz 180mW 25mA 40hFE @ 14mA, SURFACE MOUNTED, SOT-37.	PHILIPS	BFR90

A6 CPU

When ordering, prefix circuit reference with A6.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829-836	Complete unit	Issue 15	
C3	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C4	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C5	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C6 to C8	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C9 to C16	26386/867	CAPACITOR-FIXED CERAMIC 2.2nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-222-KP
C17 to C20	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C21	26421/143	CAPACITOR-FIXED ALUMINIUM 470uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-U-471-B
C22	26421/108	CAPACITOR-FIXED ALUMINIUM 4.7uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-4R7-B
C23	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C24	26421/114	CAPACITOR-FIXED ALUMINIUM 22uF +/-20% 25V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1E-KA-220-B
C25	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C26	26421/141	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1VU-101B
C27	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C28	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C29	26421/141	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1VU-101B
C30 to C115	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C116	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C117 to C173	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C174	26386/813	CAPACITOR-FIXED CERAMIC 12pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-120-JP
D1	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D2	28371/412	DIODE ZENER, BZX84-C5V1... 350mW 5.1V 5% 250mA MARKING CODE Z2, SURFACE MOUNTED, SOT-23, (TAPED).	PHILIPS	BZX84-C5V1

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A6 CPU (contd.)				
D3 to D9	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
FS1	25685/418	THERMISTOR POSITIVE-TC DISC, 7.4mm 2R67 @ 20 DEG.C, 400mW 5mm PWP, FAULT VOLTAGE 60V, TRIP	BOURNS ELECTRONICS	MF-R020
FS2	25685/418	THERMISTOR POSITIVE-TC DISC, 7.4mm 2R67 @ 20 DEG.C, 400mW 5mm PWP, FAULT VOLTAGE 60V, TRIP	BOURNS ELECTRONICS	MF-R020
IC1	28467/096	IC-MICRO PROCESSOR, 16 BIT, 68000... 10MHz, CHMOS, 68 PIN, PLCC.	SGS-THOMSON	EF68000/FN/10
IC2	28469/049	IC-DIGITAL TRANSCEIVER 74HCT245... OCTAL, BI-DIRECTIONAL, TRI-STATE BUS, CMOS-H/SPEED+TTL,	PHILIPS	74HCT245D
IC3	28469/049	IC-DIGITAL TRANSCEIVER 74HCT245... OCTAL, BI-DIRECTIONAL, TRI-STATE BUS, CMOS-H/SPEED+TTL,	PHILIPS	74HCT245D
IC4	28467/117	IC-MICRO STATIC-RAM, 128K x 8 BIT, HM628128... 5V, 100nS, 50uA MAX STANDBY CURRENT, CMOS, 32 PIN,	TOSHIBA (UK) LTD	TC551001BFL-10L
IC5	28467/117	IC-MICRO STATIC-RAM, 128K x 8 BIT, HM628128... 5V, 100nS, 50uA MAX STANDBY CURRENT, CMOS, 32 PIN,	TOSHIBA (UK) LTD	TC551001BFL-10L
IC8	28469/909	IC-MICRO STATIC-RAM, 32K x 8 BIT, MK48Z32... 5V +/-5%, 150nS, NON-VOLATILE, WITH INTERNAL LITHIUM	SGS-THOMSON	MK48Z32-100PC1
IC9	28469/909	IC-MICRO STATIC-RAM, 32K x 8 BIT, MK48Z32... 5V +/-5%, 150nS, NON-VOLATILE, WITH INTERNAL LITHIUM	SGS-THOMSON	MK48Z32-100PC1
IC16	28461/862	IC-ANALOGUE SWITCH 74HC4066... QUAD, BILATERAL SWITCH, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC4066D
IC17	28471/051	IC-MICRO EEPROM, 32K x 8 BIT, 28C256... 200nS, 5V, 200uA MAX STANDBY CURRENT, PAGE MODE, CMOS, 32	ATMEL CORPORATION	AT28C256-20JC
IC18	28471/051	IC-MICRO EEPROM, 32K x 8 BIT, 28C256... 200nS, 5V, 200uA MAX STANDBY CURRENT, PAGE MODE, CMOS, 32	ATMEL CORPORATION	AT28C256-20JC
IC19	28471/047	IC-MICRO EEPROM, 128K x 8 BIT, 28F010... 120nS, 5V & 12V, FLASH MEMORY, 10000 ERASE/PROGRAMME CYCLES,	ADVANCED MICRO DEV	AM28F010-120JC
IC20	28471/047	IC-MICRO EEPROM, 128K x 8 BIT, 28F010... 120nS, 5V & 12V, FLASH MEMORY, 10000 ERASE/PROGRAMME CYCLES,	ADVANCED MICRO DEV	AM28F010-120JC
IC21	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC22	28467/027	IC-MICRO CONTROLLER, 8291A/7210... INTERFACE BUS TALKER/LISTENER, NMOS, 40 PIN, DUAL-IN-LINE.	NEC ELECTRONICS LTD	uPD7210C
IC23	28469/114	IC-DIGITAL TRANSCEIVER 75160... OCTAL, GPIB DATA, TTL-SCHOTTKY-L/PWR, 20 PIN, DUAL-IN-LINE.	NAT. SEMICONDUCTOR	DS75160AN
IC24	28469/115	IC-DIGITAL TRANSCEIVER 75161... OCTAL, GPIB-CONTROLLER, TTL-SCHOTTKY-L/PWR, 20 PIN,	NAT. SEMICONDUCTOR	DS75161AN
IC25	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC26	28467/123	IC-MICRO PERIPHERAL, 16C452... DUAL ASYNCHRONOUS COMMUNICATIONS ELEMENT WITH PARALLEL PRINTER PORT,	TEXAS INSTRUMENTS	TL16C452FN
IC27	28469/045	IC-DIGITAL RECEIVER 1489... 4 INPUT, 4 BIT, QUAD, RS 232 RECEIVER, MOS, 14 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	DS1489M
IC28	28469/045	IC-DIGITAL RECEIVER 1489... 4 INPUT, 4 BIT, QUAD, RS 232 RECEIVER, MOS, 14 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	DS1489M

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A6 CPU (contd.)				
IC29	28469/044	IC-DIGITAL BUFFER/LINE-DRIVER 1488... QUAD, UNBALANCED, INVERTING, TO RS-232D AND CCITT V.24,	NAT. SEMICONDUCTOR	DS1488M
IC30	28467/113	IC-MICRO CONTROLLER, 8584... INTERFACE, PARALLEL-BUS MICROCONTROLLER OR PROCESSOR TO	PHILIPS	PCF8584T
IC31	28469/049	IC-DIGITAL TRANSCEIVER 74HCT245... OCTAL, BI-DIRECTIONAL, TRI-STATE BUS, CMOS-H/SPEED+TTL,	PHILIPS	74HCT245D
IC36	44535/248	IC-PROGRAMMED PAL, SET OF 1, 2965, A6 BRIDGE LOGIC.	MARCONI INSTRUMENTS LTD	
IC42	28469/049	IC-DIGITAL TRANSCEIVER 74HCT245... OCTAL, BI-DIRECTIONAL, TRI-STATE BUS, CMOS-H/SPEED+TTL,	PHILIPS	74HCT245D
IC43	28469/030	IC-DIGITAL BUFFER/LINE-DRIVER 74HCT541... OCTAL, TRI-STATE, NON-INVERTING, CMOS-H/SPEED+TTL, 20	PHILIPS	74HCT541D
IC44	28467/119	IC-MICRO REAL-TIME-CLOCK, DS1287... NON-VOLATILE, WITH INTEGRAL BATTERY & CRYSTAL, WITHOUT RAM CLEAR	SGS-THOMSON	MK48T87B24
IC45	28466/390	IC-DIGITAL NAND-GATE 74HC00... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC00D
IC46	28466/241	IC-DIGITAL NOR-GATE 74HC02... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC02D
IC47	28461/963	IC-ANALOGUE COMPARATOR LT1016... RESPONSE-TIME 14nS MAX, PRECISION, 8 PIN, DUAL-IN-LINE.	MAXIM INTEG PRODUCTS	LT1016CN8
IC48	28464/148	IC-DIGITAL COUNTER 74HC590... 8 BIT, BINARY TRI-STATE, CMOS-H/SPEED, 16 PIN, DUAL-IN-LINE.	NAT. SEMICONDUCTOR	MM74HC590N
IC49	28469/556	IC-DIGITAL REGISTER CY7C425... 9 BIT, SINGLE, FIFO 1024 WORD, ASYNCHRONOUS MODE, TRI-STATE, 65nS	ADVANCED MICRO DEV	AM7202A-50JC
IC50	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC51	28461/995	IC-ANALOGUE PHASE-LOCKED-LOOP 74HC4046... MAX Vco OPERATING FREQUENCY 12MHz, CMOS-H/SPEED, 16 PIN,	PHILIPS	74HC4046AN
IC52	28461/412	IC-ANALOGUE OPERATIONAL AMP TL072... DUAL, 18V UNITY GAIN BNDWDTH 3MHz, OFFSET VOLTAGE 10mV, SLEW	MOTOROLA INC.	TL072CD
IC53	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC54	28462/152	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC273... 8 INPUT, 8 BIT, OCTAL, WITH RESET, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC273D
IC55	28462/152	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC273... 8 INPUT, 8 BIT, OCTAL, WITH RESET, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC273D
IC56	28462/155	IC-DIGITAL FLIP-FLOP/MONOSTABLE 74HC221... DUAL, NON-RETRIGGERABLE, tW = 0.7RC, WITH RESET,	PHILIPS	74HC221D
IC57	28469/056	IC-DIGITAL INVERTER 74AC14... HEX, SCHMITT-TRIGGER OPERATION, CMOS-ADVANCED, 14 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	74AC14SC
IC58	28467/110	IC-MICRO PERIPHERAL, PCF8574A... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 16 DEVICE ADDRESS	PHILIPS	PCF8574AT
IC59	28461/862	IC-ANALOGUE SWITCH 74HC4066... QUAD, BILATERAL SWITCH, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC4066D
IC60	44535/237	IC-PROGRAMMED PAL, SET OF 1, 2965, A6 INTERRUPT LOGIC.	MARCONI INSTRUMENTS LTD	
IC61	28469/030	IC-DIGITAL BUFFER/LINE-DRIVER 74HCT541... OCTAL, TRI-STATE, NON-INVERTING, CMOS-H/SPEED+TTL, 20	PHILIPS	74HCT541D
IC62	28469/030	IC-DIGITAL BUFFER/LINE-DRIVER 74HCT541... OCTAL, TRI-STATE, NON-INVERTING, CMOS-H/SPEED+TTL, 20	PHILIPS	74HCT541D
IC63	44535/238	IC-PROGRAMMED PAL, SET OF 1, 2965, A6 DECODE LOGIC.	MARCONI INSTRUMENTS LTD	

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A6 CPU (contd.)				
IC64	28469/036	IC-DIGITAL BUFFER/LINE-DRIVER 7407... HEX, OPEN-COLLECTOR, NON-INVERTING, TTL, 14 PIN,	TEXAS INSTRUMENTS	SN7407D
IC65	28462/152	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC273... 8 INPUT, 8 BIT, OCTAL, WITH RESET, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC273D
IC66	28469/030	IC-DIGITAL BUFFER/LINE-DRIVER 74HCT541... OCTAL, TRI-STATE, NON-INVERTING, CMOS-H/SPEED+TTL, 20	PHILIPS	74HCT541D
IC67	28464/173	IC-DIGITAL COUNTER 74AC161... 4 INPUT, 4 BIT, SINGLE, BINARY, SYNCHRONOUS, PRESETTABLE + RESET,	NAT. SEMICONDUCTOR	74AC161SC
IC68	28466/030	IC-DIGITAL AND-GATE 74ACT08... 2 INPUT, QUAD, CMOS-ADVANCED+TTL, 14 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	DM74ACT08M
IC69	28462/147	IC-DIGITAL FLIP-FLOP/D-TYPE 74ACT74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR,	NAT. SEMICONDUCTOR	74ACT74SC
IC70	28462/147	IC-DIGITAL FLIP-FLOP/D-TYPE 74ACT74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR,	NAT. SEMICONDUCTOR	74ACT74SC
IC71	28469/543	IC-DIGITAL COUNTER 74HC390... 4 BIT, DUAL, DECADE RIPPLE, CMOS-H/SPEED, 16 PIN, SMALL-OUTLINE.	PHILIPS	74HC390D
IC72	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC73	28461/807	IC-ANALOGUE VOLTAGE-REGULATOR TL7705BCP... 5V SUPPLY MONITOR, VOLTAGE SUPERVISOR, 8 PIN,	TEXAS INSTRUMENTS	TL7705BCP
L1 to L4	23642/909	WOUND-PART INDUCTOR, WIDEBAND HF CHOKE, BEAD-CORE, 4B1 GRADE MATERIAL, 2.5 TURNS, TINNED COPPER WIRE.	PHILIPS	4312-020-36700
PLA to PLC	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLD	23436/902	CONNECTOR MULTIWAY, PCB HEADER, 26 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7268
PLE	23436/774	CONNECTOR MULTIWAY, PCB HEADER, 40 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7408
PLF	23436/900	CONNECTOR MULTIWAY, PCB HEADER, 10 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7108
PLG	23436/901	CONNECTOR MULTIWAY, PCB HEADER, 16 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	THOMAS & BETTS LTD	609-1607
PLH	23436/777	CONNECTOR MULTIWAY, PCB HEADER, 6 WAY, RIGHT ANGLED, 3.96mm PITCH, WITH FRICTION LOCK, GOLD	MOLEX ELECTRONICS	26-48-2066
PLJ	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLK	23436/970	CONNECTOR MULTIWAY, PCB HEADER, 34 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7348
PLN	23435/860	CONNECTOR MULTIWAY, PCB TRANSITION, 20 WAY, IDC TYPE, 4-ROW, 2.54mm ROW SPACING, 3.1-3.6mm PIN	MCMURDO INSTRUMENT	TC434-20-N-T
PLP	23435/951	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, STRAIGHT, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED.	THOMAS & BETTS LTD	609-2027
PLQ	23436/903	CONNECTOR MULTIWAY, PCB HEADER, 16 WAY, STRAIGHT, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED.	THOMAS & BETTS LTD	609-1627

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A6 CPU (contd.)				
R1	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R2	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R3	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R4	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R5	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R6	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R7 to R11	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R12	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R13	24811/191	RESISTOR-FIXED METAL-FILM 5K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K62-1%50ppm
R14	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R15	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R16	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R17	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R18	24681/548	RESISTOR-NETWORK ISOLATED, THICK-FILM, 100K 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	836C-104-X2-SR-TUBE
R19	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R20	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R21 to R29	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R30	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R31	24681/540	RESISTOR-NETWORK ISOLATED, THICK-FILM, 4K7 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	836C-472-X2-SR-TUBE
R32	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R33	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R34	24681/528	RESISTOR-NETWORK ISOLATED, THICK-FILM, 10K 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	836C-103-X2-SR-TUBE
R35	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R36	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R37	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R38 to R41	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A6 CPU (contd.)				
R43	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R44	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R45 to R47	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R48	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R49	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R50 to R52	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R53	24811/195	RESISTOR-FIXED METAL-FILM 8K25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K25-1%50ppm
R54	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R55	24811/195	RESISTOR-FIXED METAL-FILM 8K25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K25-1%50ppm
R56	24681/534	RESISTOR-NETWORK ISOLATED, THICK-FILM, 470R 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	836C-471-X2-SR-TUBE
R57	24681/534	RESISTOR-NETWORK ISOLATED, THICK-FILM, 470R 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	836C-471-X2-SR-TUBE
R58	24811/195	RESISTOR-FIXED METAL-FILM 8K25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K25-1%50ppm
R59	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R60	24681/540	RESISTOR-NETWORK ISOLATED, THICK-FILM, 4K7 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	836C-472-X2-SR-TUBE
R62	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R63	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R64	24681/528	RESISTOR-NETWORK ISOLATED, THICK-FILM, 10K 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	836C-103-X2-SR-TUBE
R65 to R67	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R68	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R69	24681/528	RESISTOR-NETWORK ISOLATED, THICK-FILM, 10K 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	836C-103-X2-SR-TUBE
R70	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R71	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R72	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R73	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R74	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R75	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A6 CPU (contd.)				
R76 to R78	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R79	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R80	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R81	24681/536	RESISTOR-NETWORK ISOLATED, THICK-FILM, 1K 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE MOUNTED,	VISHAY COMPONENTS	836C-102-X2-SR-TUBE
R82	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R85 to R110	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
TR1	28435/241	TRANSISTOR PNP BIPOLAR BCX17... 45V 100MHz 425mW 500mA 100hFE MIN @ 100mA, MARKING CODE T1, SURFACE	PHILIPS	BCX17
TR2	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR3	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR4 to TR17	28455/302	TRANSISTOR NPN BIPOLAR BCX54... 45V 130MHz 1W 1A 40hFE MIN @ 150mA, MARKING CODE BA/BB/BC/BD,	PHILIPS	BCX54

A6/2 CPU

When ordering, prefix circuit reference with A6/2.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44830-041	Complete unit	Issue 07	
C1	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C2 to C6	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C7	26451/002	CAPACITOR-FIXED ALUMINIUM 4.7uF +/-20% 35V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1VA-4R7R
C8	26451/002	CAPACITOR-FIXED ALUMINIUM 4.7uF +/-20% 35V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1VA-4R7R
C9 to C16	26386/867	CAPACITOR-FIXED CERAMIC 2.2nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-222-KP
C17	26451/002	CAPACITOR-FIXED ALUMINIUM 4.7uF +/-20% 35V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1VA-4R7R
C18 to C21	26451/010	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-101P
C22 to C24	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C25	26386/813	CAPACITOR-FIXED CERAMIC 12pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-120-JP
C26 to C30	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C31	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C32	26451/012	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 8.3 x 8.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-101P
C33	26451/010	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-101P
C34	26451/010	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-101P
C35	26451/012	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 8.3 x 8.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-101P
C36 to C39	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C50 to C103	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C105	26386/817	CAPACITOR-FIXED CERAMIC 27pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-270-JP
C106	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
D1 to D4	28624/134	LED RED, SIZE T1, HLMP-1700... 1.8 Vf TYP, 7 mA If MAX, 1.8 mcd @ 2mA - 50 DEG, TINTED, DIFFUSED.	HEWLETT-PACKARD	HLMP-1700
D5 to D13	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A6/2	**CPU (contd.)**			
D14	28371/412	DIODE ZENER, BZX84-C5V1... 350mW 5.1V 5% 250mA MARKING CODE Z2, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V1
FL1 to FL4	23642/801	FILTER RFI-SUPPRESSION, 3A RATING, SURFACE MOUNT, MULTILAYER IMPEDER, 95R IMPEDANCE @ 10MHz, 0.04R	TDK UK LTD	HF50ACC-575032-T
FS1	25685/418	THERMISTOR POSITIVE-TC DISC, 7.4mm 2R67 @ 20 DEG.C, 400mW 5mm PWP, FAULT VOLTAGE 60V, TRIP	BOURNS ELECTRONICS	MF-R020
FS2	25685/418	THERMISTOR POSITIVE-TC DISC, 7.4mm 2R67 @ 20 DEG.C, 400mW 5mm PWP, FAULT VOLTAGE 60V, TRIP	BOURNS ELECTRONICS	MF-R020
IC1	28469/051	IC-DIGITAL INVERTER 74AC04... HEX, CMOS-ADVANCED, 14 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	74AC04SC
IC2	44535/296	IC-PROGRAMMED PAL, SET OF 1, 2965, CLOCKS & COUNTER A6/2.	MARCONI INSTRUMENTS LTD	
IC3	28467/158	IC-MICRO PERIPHERAL, MAX1232... MICROPROCESSOR HOUSEKEEPING & POWER SUPPLY MONITOR, CMOS, 8 PIN,	MAXIM INTEG PRODUCTS	MAX1232CSA
IC4	44535/298	IC-PROGRAMMED PAL, SET OF 1, 2965, INTERRUPT ENCODER A6/2.	MARCONI INSTRUMENTS LTD	
IC5	28467/096	IC-MICRO PROCESSOR, 16 BIT, 68000... 10MHz, CHMOS, 68 PIN, PLCC.	SGS-THOMSON	EF68000/FN/10
IC6	28469/049	IC-DIGITAL TRANSCEIVER 74HCT245... OCTAL, BI-DIRECTIONAL, TRI-STATE BUS, CMOS-H/SPEED+TTL,	PHILIPS	74HCT245D
IC7	28469/049	IC-DIGITAL TRANSCEIVER 74HCT245... OCTAL, BI-DIRECTIONAL, TRI-STATE BUS, CMOS-H/SPEED+TTL,	PHILIPS	74HCT245D
IC8	44535/294	IC-PROGRAMMED PAL, SET OF 1, 2965, MEMORY DECODE.	MARCONI INSTRUMENTS LTD	
IC9	44535/295	IC-PROGRAMMED PAL, SET OF 1, 2965, I/O DECODE A6/2.	MARCONI INSTRUMENTS LTD	
IC10 to IC15	28471/067	IC-MICRO EEPROM, 512K x 8 BIT, 29F040... 120nS, 5V FLASH MEMORY, 10000 ERASE/PROGRAMME CYCLES, SECTOR	ADVANCED MICRO DEV	AM29F040-120EC
IC18 to IC21	28471/051	IC-MICRO EEPROM, 32K x 8 BIT, 28C256... 200nS, 5V, 200uA MAX STANDBY CURRENT, PAGE MODE, CMOS, 32	ATMEL CORPORATION	AT28C256-20JC
IC22	28461/862	IC-ANALOGUE SWITCH 74HC4066... QUAD, BILATERAL SWITCH, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC4066D
IC23	28467/154	IC-MICRO PERIPHERAL, MXD1210... NON-VOLATILE RAM CONTROLLER & POWER SUPPLY MONITOR, CMOS, 8 PIN,	MAXIM INTEG PRODUCTS	MXD1210CSA
IC25	28467/154	IC-MICRO PERIPHERAL, MXD1210... NON-VOLATILE RAM CONTROLLER & POWER SUPPLY MONITOR, CMOS, 8 PIN,	MAXIM INTEG PRODUCTS	MXD1210CSA
IC27 to IC34	28467/155	IC-MICRO STATIC-RAM, 128K x 8 BIT, HM628128... 5V, 100nS, 20uA MAX STANDBY CURRENT @ 3V, CMOS, 32	TOSHIBA (UK) LTD	TC551001BFTL-10L
IC39	44535/297	IC-PROGRAMMED PAL, SET OF 1, 2965, BRIDGE LOGIC A6/2.	MARCONI INSTRUMENTS LTD	
IC40	28469/049	IC-DIGITAL TRANSCEIVER 74HCT245... OCTAL, BI-DIRECTIONAL, TRI-STATE BUS, CMOS-H/SPEED+TTL,	PHILIPS	74HCT245D
IC41	28469/049	IC-DIGITAL TRANSCEIVER 74HCT245... OCTAL, BI-DIRECTIONAL, TRI-STATE BUS, CMOS-H/SPEED+TTL,	PHILIPS	74HCT245D

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A6/2	**CPU (contd.)**			
IC42	28469/030	IC-DIGITAL BUFFER/LINE-DRIVER 74HCT541... OCTAL, TRI-STATE, NON-INVERTING, CMOS-H/SPEED+TTL, 20	PHILIPS	74HCT541D
IC43	28467/160	IC-MICRO REAL-TIME-CLOCK, DS1285... CALENDAR, 50 BYTES OF RAM, WITHOUT INTEGRAL BATTERY & CRYSTAL,	DALLAS SEMICONDUCTOR	DS1285Q
IC44	28467/113	IC-MICRO CONTROLLER, 8584... INTERFACE, PARALLEL-BUS MICROCONTROLLER OR PROCESSOR TO	PHILIPS	PCF8584T
IC45	28469/100	IC-DIGITAL BUFFER/LINE-DRIVER AD239... INTERFACE TERMINAL WITH 3TX AND 5RX ELEMENTS, TO EIA-232-E,	ANALOG DEVICES LTD	AD239JR
IC46	28467/123	IC-MICRO PERIPHERAL, 16C452... DUAL ASYNCHRONOUS COMMUNICATIONS ELEMENT WITH PARALLEL PRINTER PORT,	TEXAS INSTRUMENTS	TL16C452FN
IC47	28462/155	IC-DIGITAL FLIP-FLOP/MONOSTABLE 74HC221... DUAL, NON-RETRIGGERABLE, tW = 0.7RC, WITH RESET,	PHILIPS	74HC221D
IC48	28462/152	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC273... 8 INPUT, 8 BIT, OCTAL, WITH RESET, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC273D
IC49	28462/152	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC273... 8 INPUT, 8 BIT, OCTAL, WITH RESET, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC273D
IC50	28469/030	IC-DIGITAL BUFFER/LINE-DRIVER 74HCT541... OCTAL, TRI-STATE, NON-INVERTING, CMOS-H/SPEED+TTL, 20	PHILIPS	74HCT541D
IC51	28462/152	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC273... 8 INPUT, 8 BIT, OCTAL, WITH RESET, CMOS-H/SPEED, 20 PIN,	PHILIPS	74HC273D
IC52	28467/025	IC-MICRO CONTROLLER, 7210... INTERFACE BUS TALK/LISTEN/CONTROL, NMOS, 40 PIN, DUAL-IN-LINE.	MARCONI INSTRUMENTS LTD	
IC53	28469/114	IC-DIGITAL TRANSCEIVER 75160... OCTAL, GPIB DATA, TTL-SCHOTTKY-L/PWR, 20 PIN, DUAL-IN-LINE.	NAT. SEMICONDUCTOR	DS75160AN
IC54	28469/115	IC-DIGITAL TRANSCEIVER 75161... OCTAL, GPIB-CONTROLLER, TTL-SCHOTTKY-L/PWR, 20 PIN,	NAT. SEMICONDUCTOR	DS75161AN
IC55	28461/042	IC-ANALOGUE COMPARATOR LT1016... I/P-OFFSET 3mV MAX, RESPONSE TIME 14nS MAX, TTL, 8 PIN,	MAXIM INTEG PRODUCTS	LT1016CS8
IC56	28469/556	IC-DIGITAL REGISTER CY7C425... 9 BIT, SINGLE, FIFO 1024 WORD, ASYNCHRONOUS MODE, TRI-STATE, 65nS	ADVANCED MICRO DEV	AM7202A-50JC
IC57	28461/059	IC-ANALOGUE PHASE-LOCKED-LOOP 74HC4046A... MAX Vco OPERATING FREQUENCY 12MHz, CMOS-H/SPEED, 16 PIN,	PHILIPS	74HC4046AD
IC58	28461/412	IC-ANALOGUE OPERATIONAL AMP TL072... DUAL, 18V UNITY GAIN BNDWDTH 3MHz, OFFSET VOLTAGE 10mV, SLEW	MOTOROLA INC.	TL072CD
IC59	28467/110	IC-MICRO PERIPHERAL, PCF8574A... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 16 DEVICE ADDRESS	PHILIPS	PCF8574AT
IC60	28461/862	IC-ANALOGUE SWITCH 74HC4066... QUAD, BILATERAL SWITCH, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC4066D
L1	23642/701	INDUCTOR-FIXED 2.2uH +/- 5% EPOXY-MOULD, 320mA 1R MAX, 30 Q @ 7.96 MHz, 75 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-2R2-J
PLA	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLC	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLD	23436/902	CONNECTOR MULTIWAY, PCB HEADER, 26 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7268

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A6/2	**CPU (contd.)**			
PLE	23436/774	CONNECTOR MULTIWAY, PCB HEADER, 40 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7408
PLF	23436/900	CONNECTOR MULTIWAY, PCB HEADER, 10 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7108
PLG	23436/901	CONNECTOR MULTIWAY, PCB HEADER, 16 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	THOMAS & BETTS LTD	609-1607
PLH	23436/777	CONNECTOR MULTIWAY, PCB HEADER, 6 WAY, RIGHT ANGLED, 3.96mm PITCH, WITH FRICTION LOCK, GOLD	MOLEX ELECTRONICS	26-48-2066
PLJ	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLK	23437/064	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD20RP
PLL	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLM	23437/062	CONNECTOR MULTIWAY, PCB HEADER, 14 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD14RP
PLP	23437/064	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD20RP
R2	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R3 to R8	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R9 to R17	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R18 to R25	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R26 to R29	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R30 to R39	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R40 to R43	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R44 to R47	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R48	24681/528	RESISTOR-NETWORK ISOLATED, THICK-FILM, 10K 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	SOMC16-03-103-G-REEL
R49 to R53	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R54 to R61	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R62 to R64	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R65	24681/540	RESISTOR-NETWORK ISOLATED, THICK-FILM, 4K7 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	SOMC16-03-472-G-TUBE
R66	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R67	24681/536	RESISTOR-NETWORK ISOLATED, THICK-FILM, 1K 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE MOUNTED,	VISHAY COMPONENTS	SOMC16-03-102-G-TUBE

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A6/2	**CPU (contd.)**			
R68	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R69	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R70 to R77	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R78	24681/528	RESISTOR-NETWORK ISOLATED, THICK-FILM, 10K 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	SOMC16-03-103-G-REEL
R79 to R84	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R85	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R86	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R87 to R89	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R90	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R91	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R92	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R93	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R94	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R95	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R96	24811/194	RESISTOR-FIXED METAL-FILM 7K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-7K5-1%50ppm
R97	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R98	24811/194	RESISTOR-FIXED METAL-FILM 7K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-7K5-1%50ppm
R99	24811/145	RESISTOR-FIXED METAL-FILM 68R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68R1-1%50ppm
R100	24681/540	RESISTOR-NETWORK ISOLATED, THICK-FILM, 4K7 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE	VISHAY COMPONENTS	SOMC16-03-472-G-TUBE
R101	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R102	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R104 to R107	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R108 to R111	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R112	24811/101	RESISTOR-FIXED METAL-FILM 1R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1R-1%-50ppm
R113	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R114	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A6/2	**CPU (contd.)**			
R115	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R116	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R117	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R118	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R119	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
SKN	43138/097	RIBBON-LEAD 20 WAY, SOCKET 20 WAY, - PCB TRANSITION 20 WAY, FLAT MULTICOLOUR CABLE, 120mm		
SKS	23437/525	CONNECTOR MULTIWAY, SOCKET, 50 WAY, STRAIGHT, 2-ROW, 2mm GRID, SURFACE MOUNTING, SLOTTED TAILS,	SAMTEC ELECTRONICS	SMM-125-02-S-D-P
SKT to SKX	23437/524	CONNECTOR MULTIWAY, SOCKET, 8 WAY, STRAIGHT, 2-ROW, 2mm GRID, SURFACE MOUNTING, SLOTTED TAILS,	SAMTEC ELECTRONICS	SMM-104-02-S-D-P
TR1 to TR14	28455/302	TRANSISTOR NPN BIPOLAR BCX54... 45V 130MHz 1W 1A 40hFE MIN @ 150mA, MARKING CODE BA, SURFACE	PHILIPS	BCX54
XL1	28312/301	CRYSTAL 0.032768 MHz +/- 100 ppm, 12.5pF PARALLEL RESONANCE, 50K ESR MAX, 90SMX STYLE, SURFACE	IQD LTD	A103D

A7 Front panel interface

When ordering, prefix circuit reference with A7.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829-837	Complete unit	Issue 10	
C1 to C3	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C4	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C5	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C6	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C7	26386/828	CAPACITOR-FIXED CERAMIC 220pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-221-JP
C8	26386/759	CAPACITOR-FIXED CERAMIC 22nF +/-20% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	PHILIPS	1206-2R-223-K9-BB
C9 to C12	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C13	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C15	26386/815	CAPACITOR-FIXED CERAMIC 18pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-180-JP
C16	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C17	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C18	26343/784	CAPACITOR-FIXED CERAMIC 68pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-680-JP
C19	26386/813	CAPACITOR-FIXED CERAMIC 12pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-120-JP
C20	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C21	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C22	26386/814	CAPACITOR-FIXED CERAMIC 15pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-150-JP
C23 to C25	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C26	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C27	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C28	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C29	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C30	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C31	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A7 Front panel interface (contd.)				
C32	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C33	26421/118	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-KA-101-B
C34	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C35 to C38	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C39	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C40 to C87	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C88	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C89	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
D1	28383/910	DIODE SMALL-SIGNAL, BAS28... DUAL, 330mW 75V 250mA ELECTRICALLY ISOLATED, MARKING CODE A61 OR JT,	PHILIPS	BAS28
D2	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D3	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
D4	28383/910	DIODE SMALL-SIGNAL, BAS28... DUAL, 330mW 75V 250mA ELECTRICALLY ISOLATED, MARKING CODE A61 OR JT,	PHILIPS	BAS28
D7	28372/103	DIODE ZENER, BZX84-C11... 350mW 11V 5% 250mA MARKING CODE Y1, SURFACE MOUNTED, SOT-23, (TAPED).	PHILIPS	BZX84-C11
D8	28373/273	DIODE ZENER, BZX84-C22... 350mW 22V 5% 250mA MARKING CODE Y8, SURFACE MOUNTED, SOT-23, (TAPED).	PHILIPS	BZX84-C22
D9 to D11	28383/910	DIODE SMALL-SIGNAL, BAS28... DUAL, 330mW 75V 250mA ELECTRICALLY ISOLATED, MARKING CODE A61 OR JT,	PHILIPS	BAS28
D12	28349/011	DIODE SMALL-SIGNAL, SCHOTTKY, 5082-2826... 250mW 15V 1.2pF 1Vf @ 20mA, BATCH MATCHED TO WITHIN 10mV	HEWLETT-PACKARD	5082-2826-T25
D13	28349/011	DIODE SMALL-SIGNAL, SCHOTTKY, 5082-2826... 250mW 15V 1.2pF 1Vf @ 20mA, BATCH MATCHED TO WITHIN 10mV	HEWLETT-PACKARD	5082-2826-T25
D14	28383/901	DIODE SMALL-SIGNAL, BAV70... DUAL, 70V 100mA 1.1Vf @ 50mA, COMMON CATHODE, MARKING CODE A4, SURFACE	PHILIPS	BAV70
IC1	28467/122	IC-MICRO CONTROLLER, 80C552... 8 BIT, 12MHz, 256 BYTE RAM, ZERO ROM, I.IC BUS, DUPLEX UART, 6 x 8	PHILIPS	PCB80C552-5 16WP
IC2	28462/431	IC-DIGITAL LATCH 74HCT373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED+TTL, 20 PIN,	PHILIPS	74HCT373D
IC3	28465/053	IC-DIGITAL DECODER/DEMULTIPLEX 74HCT138... 3 INPUT, 8 BIT, SINGLE, INVERTING, 3 BIT ADDRESS,	PHILIPS	74HCT138D
IC5	28467/121	IC-MICRO STATIC-RAM, 8K x 8 BIT, TC5565AFL-10... 100nS ACCESS, 10uW STANDBY, CMOS, 28 PIN,	TOSHIBA (UK) LTD	TC5565AFL-10
IC6	28466/412	IC-DIGITAL EXCLUSIVE-OR 74HCT86... 2 INPUT, QUAD, CMOS-H/SPEED+TTL, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HCT86D

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A7 Front panel interface (contd.)				
IC7	28462/141	IC-DIGITAL FLIP-FLOP/D-TYPE 74HCT377... OCTAL, POS EDGE TRIGGER WITH DATA ENABLE, CMOS-H/SPEED+TTL,	PHILIPS	74HCT377D
IC8	28469/028	IC-DIGITAL BUFFER/LINE-DRIVER 74HCT244... OCTAL, NON-INVERTING, TRI-STATE BUS, CMOS-H/SPEED+TTL, 20	PHILIPS	74HCT244D
IC9	28469/028	IC-DIGITAL BUFFER/LINE-DRIVER 74HCT244... OCTAL, NON-INVERTING, TRI-STATE BUS, CMOS-H/SPEED+TTL, 20	PHILIPS	74HCT244D
IC10	28462/430	IC-DIGITAL FLIP-FLOP/D-TYPE 74HCT374... 1 INPUT, OCTAL, NON-INVERTING, POS EDGE TRIGGER, TRI-STATE,	PHILIPS	74HCT374D
IC11	28469/049	IC-DIGITAL TRANSCEIVER 74HCT245... OCTAL, BI-DIRECTIONAL, TRI-STATE BUS, CMOS-H/SPEED+TTL,	PHILIPS	74HCT245D
IC12	28469/028	IC-DIGITAL BUFFER/LINE-DRIVER 74HCT244... OCTAL, NON-INVERTING, TRI-STATE BUS, CMOS-H/SPEED+TTL, 20	PHILIPS	74HCT244D
IC13	28462/136	IC-DIGITAL FLIP-FLOP/D-TYPE 74HCT74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR,	PHILIPS	74HCT74D
IC14	28462/159	IC-DIGITAL FLIP-FLOP/D-TYPE 74HCT273... OCTAL, POS EDGE TRIGGER, RESET, CMOS-H/SPEED+TTL, 20 PIN,	PHILIPS	74HCT273D
IC15	28462/136	IC-DIGITAL FLIP-FLOP/D-TYPE 74HCT74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR,	PHILIPS	74HCT74D
IC16	28461/811	IC-ANALOGUE VOLTAGE-REFERENCE LT1019... 10V PRECISION, OUTPUT VOLTAGE DRIFT 20ppm/DEG.C MAX,	LINEAR TECHNOLOGY	LT1019CS8-10
IC17	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	SILICONIX LTD	DG419DY
IC18	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC19	28461/673	IC-ANALOGUE COMPARATOR LM339... QUAD, SINGLE SUPPLY, BIPOLAR, 14 PIN, SMALL-OUTLINE.	PHILIPS	LM339D
IC20	28461/812	IC-ANALOGUE OPERATIONAL AMP AD705... SINGLE, 15V OFFSET VOLTAGE 150uV, OFFSET CURRENT 150pA,	ANALOG DEVICES LTD	AD705JR
IC21	28385/996	RELAY SOLID-STATE, OPTO-COUPLED, 3VDC CONTROL, 150mA AC/DC MAX LOAD, MOS FET O/P, PCB MOUNTING, 6	NEC ELECTRONICS LTD	PFA141A
IC22	28385/996	RELAY SOLID-STATE, OPTO-COUPLED, 3VDC CONTROL, 150mA AC/DC MAX LOAD, MOS FET O/P, PCB MOUNTING, 6	NEC ELECTRONICS LTD	PFA141A
IC23	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC24	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC25	28461/896	IC-ANALOGUE SWITCH DG413... QUAD, 15V SPST, ON-RESISTANCE<35R, 2 x N/O & 2 x N/C @ LOGIC 1,	SILICONIX LTD	DG413DY
IC26	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC27	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC28	28462/155	IC-DIGITAL FLIP-FLOP/MONOSTABLE 74HC221... DUAL, NON-RETRIGGERABLE, tW = 0.7RC, WITH RESET,	PHILIPS	74HC221D
IC29	28466/117	IC-DIGITAL OR-GATE 74HCT32... 2 INPUT, QUAD, CMOS-H/SPEED+TTL, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HCT32D
IC30	28466/241	IC-DIGITAL NOR-GATE 74HC02... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC02D
IC31	28466/385	IC-DIGITAL NAND-GATE 74HCT00... 2 INPUT, QUAD, CMOS-H/SPEED+TTL, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HCT00D

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A7 Front panel interface (contd.)				
L1 to L4	23642/535	INDUCTOR-FIXED 1uH +/- 5% MOULDED-EPOXY, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L5	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% MOULDED-EPOXY, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-4R7-J
L6	23642/707	INDUCTOR-FIXED 100uH +/- 5% MOULDED-EPOXY, 40mA 10R MAX, 20 Q @ 0.796 MHz, 10 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-101-J
L7	23642/706	INDUCTOR-FIXED 15uH +/- 5% MOULDED-EPOXY, 130mA 2R8 MAX, 30 Q @ 2.52 MHz, 30 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-150-J
L10	23642/535	INDUCTOR-FIXED 1uH +/- 5% MOULDED-EPOXY, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
PLA	23435/950	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7208
PLC	23435/112	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-107-36
PLD	23444/388	CONNECTOR-RF SMC-TYPE MALE, RECEPTACLE, 50 OHMS, ELBOW, PCB-MOUNTING, NICKEL PLATED BODY.	ITT CANNON (UK)	050-053-0000-910
PLE	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLF	23436/725	CONNECTOR MULTIWAY, SOCKET, 68 WAY, RIGHT ANGLED, 2-ROW, 2.54mm PITCH, 1.9mm ROW SPACING, FOR MEMORY	ITT CANNON (UK)	DICMJ-68-P-RPC
R1 to R3	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R4	24681/671	RESISTOR-NETWORK BUSSED, THICK-FILM, 10K 2% 1W 50V 100 ppm/DEG.C, 9 RESISTORS, LOW PROFILE, 10 PIN,	VISHAY COMPONENTS	LC0-001-1002G
R9	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R10 to R14	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R15	24681/671	RESISTOR-NETWORK BUSSED, THICK-FILM, 10K 2% 1W 50V 100 ppm/DEG.C, 9 RESISTORS, LOW PROFILE, 10 PIN,	VISHAY COMPONENTS	LC0-001-1002G
R23	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R24	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R25 to R28	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R29 to R32	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R33 to R40	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R41 to R61	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R62	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R63	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A7 Front panel interface (contd.)				
R64	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R65 to R69	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R70	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R71	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R72	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R73	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R74	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R75	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R76	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R77	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R78	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R79	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R80 to R82	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R83	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R84	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R85	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R86	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R92	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R93	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R95	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R96	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R97	24753/229	RESISTOR-FIXED METAL-FILM 1M +/- 0.1% 250mW 200V 25 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	EE.10-1M0-B-T-9
R98	24753/229	RESISTOR-FIXED METAL-FILM 1M +/- 0.1% 250mW 200V 25 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	EE.10-1M0-B-T-9
R99	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R100	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R101	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm

A7 Front panel interface (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R102	24811/195	RESISTOR-FIXED METAL-FILM 8K25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K25-1%50ppm
R103	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R104	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R105	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R106 to R111	24753/229	RESISTOR-FIXED METAL-FILM 1M +/- 0.1% 250mW 200V 25 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	EE.10-1M0-B-T-9
R112	24811/604	RESISTOR-FIXED METAL-FILM 75K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-75K0-0.1%-15
R113	24811/604	RESISTOR-FIXED METAL-FILM 75K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-75K0-0.1%-15
R114	24811/603	RESISTOR-FIXED METAL-FILM 100K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-0.1%-15
R115	24811/603	RESISTOR-FIXED METAL-FILM 100K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-0.1%-15
R116 to R118	24753/229	RESISTOR-FIXED METAL-FILM 1M +/- 0.1% 250mW 200V 25 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	EE.10-1M0-B-T-9
R119	24811/633	RESISTOR-FIXED METAL-FILM 30K1 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-30K1-0.1%-15
R120	24811/633	RESISTOR-FIXED METAL-FILM 30K1 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-30K1-0.1%-15
R121 to R123	24753/229	RESISTOR-FIXED METAL-FILM 1M +/- 0.1% 250mW 200V 25 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	EE.10-1M0-B-T-9
R124	24811/601	RESISTOR-FIXED METAL-FILM 33K2 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-0.1%-15
R125	24811/634	RESISTOR-FIXED METAL-FILM 2K21 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-0.1%-15
R126	25748/572	RESISTOR-VARIABLE CERMET LINEAR, 100K 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	BOURNS ELECTRONICS	3299W-1-104
R127	24811/243	RESISTOR-FIXED METAL-FILM 825K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825K-1%50ppm
R128	24811/635	RESISTOR-FIXED METAL-FILM 68K1 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68K1-0.1%-15
R129	24811/198	RESISTOR-FIXED METAL-FILM 11K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-11K-1%50ppm
R130	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R131	24811/204	RESISTOR-FIXED METAL-FILM 20K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20K-1%50ppm
R132	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R133	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R134	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R135	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R136	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A7 Front panel interface (contd.)				
R137	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R138	24811/154	RESISTOR-FIXED METAL-FILM 162R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-162R-1%50ppm
R139	24811/172	RESISTOR-FIXED METAL-FILM 909R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-909R-1%50ppm
R140	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R141	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R142	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R143	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R144	24811/158	RESISTOR-FIXED METAL-FILM 243R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-243R-1%50ppm
R145	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R146	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R147	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R148	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R149	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R150	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R151	24811/229	RESISTOR-FIXED METAL-FILM 221K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221K-1%50ppm
R152	24811/229	RESISTOR-FIXED METAL-FILM 221K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221K-1%50ppm
R153	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R154	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R155	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R156	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R157	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R158	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R159	24811/618	RESISTOR-FIXED METAL-FILM 100R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-0.1%-15
R160	24811/610	RESISTOR-FIXED METAL-FILM 909R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-909R-0.1%-15
R161	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R162	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A7 Front panel interface (contd.)				
R163	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R164	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R165	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
RLA	23486/183	RELAY MAGNETIC, DOUBLE-POLE N/O & N/C, 5V COIL, 84R - POLARISED, CONTACTS 5A @ 30VDC, PCB	MATSUSHITA CONTROLS	DSP1-5V
RLB	23486/184	RELAY MAGNETIC, DOUBLE-POLE N/O, POLARISED, 5V COIL, 84R - CONTACTS 5A @ 30VDC, PCB MOUNTING, 6	MATSUSHITA CONTROLS	DSP2a-5V
RLC	23486/183	RELAY MAGNETIC, DOUBLE-POLE N/O & N/C, 5V COIL, 84R - POLARISED, CONTACTS 5A @ 30VDC, PCB	MATSUSHITA CONTROLS	DSP1-5V
RLD	23486/181	RELAY MAGNETIC, SINGLE-POLE CHANGEOVER, POLARISED DUAL 5V COIL, 62R - LATCHING, ISOL 60dB @ 1.8GHz,	MATSUSHITA CONTROLS	RK1-L2-5V-H23
RLE	23486/184	RELAY MAGNETIC, DOUBLE-POLE N/O, POLARISED, 5V COIL, 84R - CONTACTS 5A @ 30VDC, PCB MOUNTING, 6	MATSUSHITA CONTROLS	DSP2a-5V
SKA	23436/727	CONNECTOR MULTIWAY, SOCKET, 22 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, PCB MOUNTING, CONTACTS GOLD	BERG ELECTRONICS	89883-311
SKB	23436/726	CONNECTOR MULTIWAY, SOCKET, 6 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, PCB MOUNTING, CONTACTS GOLD	BERG ELECTRONICS	89883-303
TR1	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR2	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR3 to TR5	28455/302	TRANSISTOR NPN BIPOLAR BCX54... 45V 130MHz 1W 1A 40hFE MIN @ 150mA, MARKING CODE BA/BB/BC/BD,	PHILIPS	BCX54
TR6	28461/864	TRANSISTOR NPN BIPOLAR 3046... ARRAY, 20V 50mA 5-TRANSISTORS, 3-SINGLES & 1-PAIR, SURFACE	NAT. SEMICONDUCTOR	LM3046M
TR7	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR8	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR9	28435/241	TRANSISTOR PNP BIPOLAR BCX17... 45V 100MHz 425mW 500mA 100hFE MIN @ 100mA, MARKING CODE T1, SURFACE	PHILIPS	BCX17
TR10	28455/302	TRANSISTOR NPN BIPOLAR BCX54... 45V 130MHz 1W 1A 40hFE MIN @ 150mA, MARKING CODE BA/BB/BC/BD,	PHILIPS	BCX54
TR11	28455/302	TRANSISTOR NPN BIPOLAR BCX54... 45V 130MHz 1W 1A 40hFE MIN @ 150mA, MARKING CODE BA/BB/BC/BD,	PHILIPS	BCX54
TR12	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR13	28455/302	TRANSISTOR NPN BIPOLAR BCX54... 45V 130MHz 1W 1A 40hFE MIN @ 150mA, MARKING CODE BA/BB/BC/BD,	PHILIPS	BCX54

A8 Complex modem and IF

When ordering, prefix circuit reference with A8.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829-838	Complete unit	Issue 07	
C1	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C2	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C3	26386/992	CAPACITOR-FIXED CERAMIC 330nF +/-10% 50V X7R, MULTILAYER, SURFACE-MOUNTED, SIZE 1812, NICKEL	PHILIPS	1812-2B-334-K9BB
C4 to C9	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C10 to C12	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C13	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C14	26386/823	CAPACITOR-FIXED CERAMIC 82pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-820-JP
C15	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C16 to C18	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C19	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C20 to C36	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C37	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C38	26386/827	CAPACITOR-FIXED CERAMIC 180pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-181-JP
C39	26386/831	CAPACITOR-FIXED CERAMIC 390pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-391-JP
C40	26386/831	CAPACITOR-FIXED CERAMIC 390pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-391-JP
C41	26386/827	CAPACITOR-FIXED CERAMIC 180pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-181-JP
C42 to C50	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C51	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C52 to C55	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C56	26386/827	CAPACITOR-FIXED CERAMIC 180pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-181-JP
C57	26386/831	CAPACITOR-FIXED CERAMIC 390pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-391-JP
C58	26386/831	CAPACITOR-FIXED CERAMIC 390pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-391-JP
C59	26386/827	CAPACITOR-FIXED CERAMIC 180pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-181-JP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A8 Complex modem and IF (contd.)				
C60	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C61	26386/815	CAPACITOR-FIXED CERAMIC 18pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-180-JP
C62	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C63	26386/815	CAPACITOR-FIXED CERAMIC 18pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-180-JP
C64 to C66	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C67	26386/833	CAPACITOR-FIXED CERAMIC 560pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-561-JP
C68	26386/867	CAPACITOR-FIXED CERAMIC 2.2nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-222-KP
C69	26386/867	CAPACITOR-FIXED CERAMIC 2.2nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-222-KP
C70	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C71	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C72	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C73	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C74	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C75	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C76	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C77	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C78	26386/783	CAPACITOR-FIXED CERAMIC 330pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-331-FAT-1A
C79	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C80	26386/783	CAPACITOR-FIXED CERAMIC 330pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-331-FAT-1A
C81	26386/783	CAPACITOR-FIXED CERAMIC 330pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-331-FAT-1A
C82	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C83	26386/934	CAPACITOR-FIXED CERAMIC 220pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-221-FAT-1A
C84	26386/931	CAPACITOR-FIXED CERAMIC 470pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-471-FAT-1A
C85	26386/816	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-220-JP
C86	26386/782	CAPACITOR-FIXED CERAMIC 120pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-121-FAT-1A
C87	26386/783	CAPACITOR-FIXED CERAMIC 330pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-331-FAT-1A

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A8 Complex modem and IF (contd.)				
C88	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C89	26386/934	CAPACITOR-FIXED CERAMIC 220pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-221-FAT-1A
C90	26386/931	CAPACITOR-FIXED CERAMIC 470pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-471-FAT-1A
C91	26386/816	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-220-JP
C92	26386/782	CAPACITOR-FIXED CERAMIC 120pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-121-FAT-1A
C93	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C94	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C95	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C96	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C97	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C98 to C100	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C101	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C102	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C103	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C104	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C105	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C106	26386/821	CAPACITOR-FIXED CERAMIC 56pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-560-JP
C107	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C108	26386/816	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-220-JP
C109	26386/816	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-220-JP
C110	26386/821	CAPACITOR-FIXED CERAMIC 56pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-560-JP
C111	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C112	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C113	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C114	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C115	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP

A8 Complex modem and IF (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
C116	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C117	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C118	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C119	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C120	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C121	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C122	26386/777	CAPACITOR-FIXED CERAMIC 47nF +/-20% 63V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	PHILIPS	1206-2R-473-K9-BBC
C123	26386/867	CAPACITOR-FIXED CERAMIC 2.2nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-222-KP
C124	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C125	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C126	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C127	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C128	26386/777	CAPACITOR-FIXED CERAMIC 47nF +/-20% 63V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	PHILIPS	1206-2R-473-K9-BBC
C129	26386/829	CAPACITOR-FIXED CERAMIC 270pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-271-JP
C130	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C150	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C151	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C152	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C153	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C154	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C155	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C156	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C157	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C158	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C160	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C161	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A8 Complex modem and IF (contd.)				
C162	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C163 to C170	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C171	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C172	26386/816	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-220-JP
C173	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C174	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C175	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C177	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C178	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C179	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C181	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C182	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C183	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C184	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C185	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C191	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C192	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C193 to C196	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C197	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C198 to C200	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C202	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C203	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C204	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C205 to C274	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C275	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C276	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A8 Complex modem and IF (contd.)				
C277 to C281	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C282	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C283	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C284	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C285	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C286	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C287 to C302	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C305	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C306	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C307	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C308	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C309 to C313	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C314	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C315 to C319	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C320	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C321	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C322 to C324	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
D1	28381/532	DIODE VARIABLE CAPACITNCE, BB619... 30V 20mA 2.9pF @ 28V, CAPAC RATIO 12.5 MIN, SURFACE MOUNTED,	PHILIPS	BB619
D2	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D3	28383/962	DIODE PIN, BAR60... TRIPLE, 100V 0.25pF 1.05Vf @ 100mA, T-CIRCUIT, MARKING CODE 60, SURFACE	SIEMENS LTD	BAR60
D4	28349/036	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2825... DUAL, 8V 1pF 340mVf @ 1mA, ISOLATED, MARKING CODE C5,	HEWLETT-PACKARD	HSMS-2825-L31
D5	28383/962	DIODE PIN, BAR60... TRIPLE, 100V 0.25pF 1.05Vf @ 100mA, T-CIRCUIT, MARKING CODE 60, SURFACE	SIEMENS LTD	BAR60
D6	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D7	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A8 Complex modem and IF (contd.)				
D8	28383/962	DIODE PIN, BAR60... TRIPLE, 100V 0.25pF 1.05Vf @ 100mA, T-CIRCUIT, MARKING CODE 60, SURFACE	SIEMENS LTD	BAR60
D9	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D10	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
IC1	28464/173	IC-DIGITAL COUNTER 74AC161... 4 INPUT, 4 BIT, SINGLE, BINARY, SYNCHRONOUS, PRESETTABLE + RESET,	NAT. SEMICONDUCTOR	74AC161SC
IC2	28461/819	IC-ANALOGUE OPERATIONAL AMP OP177... SINGLE, 22V OFFSET VOLTAGE 25uV, OFFSET CURRENT 1.5nA,	ANALOG DEVICES LTD	OP177GS
IC3	28461/459	IC-ANALOGUE OPERATIONAL AMP TL032... DUAL, 15V U/GAIN BANDWDTH 1.1MHz, OFFSET VOLTAGE 2.0mV, SLEW	TEXAS INSTRUMENTS	TL032CD(TUBE)
IC4	28461/044	IC-ANALOGUE D/A-CONVERTER 7543... 12 BIT, MULTIPLYING, SERIAL INPUT, NON-LIN ERR +/-1 LSB,	ANALOG DEVICES LTD	PM7543FS
IC5	28461/806	IC-ANALOGUE OPERATIONAL AMP OP-249... DUAL, PRECISION HI SPEED, SETTLING TIME-1.2uS, GAIN	ANALOG DEVICES LTD	OP-249GS
IC6	28461/447	IC-ANALOGUE MICROWAVE-AMP MSA-0886... 7.8V 36mA GAIN 22.5dB @1GHz, 25dB BNDWIDTH DC-5GHz, BIPOLAR,	HEWLETT-PACKARD	MSA-0886-TR1
IC7	28461/801	IC-ANALOGUE MICROWAVE-AMP MSA-1105... 5.5V 60mA GAIN 10.5dB @1GHz, 3dB B/WTH 0.05-1.3GHz, BIPOLAR,	HEWLETT-PACKARD	MSA-1105
IC8	28469/051	IC-DIGITAL INVERTER 74AC04... HEX, CMOS-ADVANCED, 14 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	74AC04SC
IC9	28461/448	IC-ANALOGUE MICROWAVE-AMP MSA-0386... 5V 35mA GAIN 12dB @ 1GHz, 3dB BANDWIDTH DC-2.4GHz, BIPOLAR, 4	HEWLETT-PACKARD	MSA-0386-TR1
IC10	28461/447	IC-ANALOGUE MICROWAVE-AMP MSA-0886... 7.8V 36mA GAIN 22.5dB @1GHz, 25dB BNDWIDTH DC-5GHz, BIPOLAR,	HEWLETT-PACKARD	MSA-0886-TR1
IC11	28461/508	IC-ANALOGUE WIDEBAND-AMPLIFIER AD600... DUAL, 2dB NOISE @ MAX GAIN, VOLTAGE CONTROLLED GAIN, 10mm	ANALOG DEVICES LTD	AD600JR
IC12	28461/803	IC-ANALOGUE VOLTAGE-REFERENCE LT1019... 5V PRECISION, OUTPUT VOLTAGE DRIFT 20ppm/DEG.C MAX,	LINEAR TECHNOLOGY	LT1019CS8-5
IC13	28461/005	IC-ANALOGUE D/A-CONVERTER 7524... 15V 8 BIT, BUFFERED, MULTIPLYING, REL-ACC +/-1/2LSB, GAIN-ERR	ANALOG DEVICES LTD	PM7524FS
IC14	28461/005	IC-ANALOGUE D/A-CONVERTER 7524... 15V 8 BIT, BUFFERED, MULTIPLYING, REL-ACC +/-1/2LSB, GAIN-ERR	ANALOG DEVICES LTD	PM7524FS
IC15	28461/506	IC-ANALOGUE OPERATIONAL AMP OPA2604... DUAL, 25V BNDWIDTH PROD 20MHz, OFFSET VOLTAGE 3mV, SLEW RATE	BURR-BROWN INTERNAT	OPA2604AU
IC16	28461/506	IC-ANALOGUE OPERATIONAL AMP OPA2604... DUAL, 25V BNDWIDTH PROD 20MHz, OFFSET VOLTAGE 3mV, SLEW RATE	BURR-BROWN INTERNAT	OPA2604AU
IC17	28461/413	IC-ANALOGUE OPERATIONAL AMP TL074... QUAD, JFET INPUT, LOW NOISE, SLEW RATE 8V/uS MIN, GAIN	MOTOROLA INC.	TL074CD
IC18	28461/844	IC-ANALOGUE MODULATR/DEMODULATOR 1496... 30V BALANCED, SUPPRESSION 50dB @ 10MHz, 3dB SIGNAL	NAT. SEMICONDUCTOR	LM1496M
IC19	28461/844	IC-ANALOGUE MODULATR/DEMODULATOR 1496... 30V BALANCED, SUPPRESSION 50dB @ 10MHz, 3dB SIGNAL	NAT. SEMICONDUCTOR	LM1496M
IC20	28462/133	IC-DIGITAL FLIP-FLOP/D-TYPE 74F74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR,	PHILIPS	N74F74D
IC21	28461/792	IC-ANALOGUE VOLTAGE-REGULATOR LM317L... 32V 100mA POSITIVE ADJUSTABLE, LINEAR, MONOLITHIC, 8 PIN,	NAT. SEMICONDUCTOR	LM317LM

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A8 Complex modem and IF (contd.)				
IC22	28461/774	IC-ANALOGUE VOLTAGE-REGULATOR 78L05AC... 5V +/-5%, POSITIVE, LINEAR, BIPOLAR, 8 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	LM78L05ACM
IC23	28464/043	IC-DIGITAL FREQ SYNTHESIZER MC145170... SERIAL DATA PORTS, 160MHz MAX, SINGLE MODULUS, DUAL PHASE	MOTOROLA INC.	MC145170D
IC24	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC25	28461/437	IC-ANALOGUE OPERATIONAL AMP 5534... 2 INPUT, SINGLE, 10V 16mA LOW NOISE, 10MHz, BIPOLAR, 8 PIN,	PHILIPS	NE5534D
IC26	28467/159	IC-MICRO DIGIT/SGNL PROCESSR, ADSP2115... 16.7MHz, DIGITAL SIGNAL PROCESSING, 1K PROGRAM & 512 WORD	ANALOG DEVICES LTD	ADSP-2115KP-66
IC27	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)
IC28	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)
IC29	28467/156	IC-MICRO STATIC-RAM, 8K x 8 BIT, KM6865B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT7164S-15Y(TUBE)
IC30	28469/619	IC-DIGITAL FIELDPROG-GATE-ARRAY FX740... 80MHz, 40 MACROCELLS, 3.3V/5V O/P, tPD 10nS, BOUNDARY SCAN &	ALTERA (US)	EPX740LC68-10
IC31	28469/556	IC-DIGITAL REGISTER CY7C425... 9 BIT, SINGLE, FIFO 1024 WORD, ASYNCHRONOUS MODE, TRI-STATE, 65nS	ADVANCED MICRO DEV	AM7202A-50JC
IC32	28467/159	IC-MICRO DIGIT/SGNL PROCESSR, ADSP2115... 16.7MHz, DIGITAL SIGNAL PROCESSING, 1K PROGRAM & 512 WORD	ANALOG DEVICES LTD	ADSP-2115KP-66
IC33	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)
IC34	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)
IC35	28467/156	IC-MICRO STATIC-RAM, 8K x 8 BIT, KM6865B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT7164S-15Y(TUBE)
IC36	28469/619	IC-DIGITAL FIELDPROG-GATE-ARRAY FX740... 80MHz, 40 MACROCELLS, 3.3V/5V O/P, tPD 10nS, BOUNDARY SCAN &	ALTERA (US)	EPX740LC68-10
IC37	28469/556	IC-DIGITAL REGISTER CY7C425... 9 BIT, SINGLE, FIFO 1024 WORD, ASYNCHRONOUS MODE, TRI-STATE, 65nS	ADVANCED MICRO DEV	AM7202A-50JC
IC38	28467/159	IC-MICRO DIGIT/SGNL PROCESSR, ADSP2115... 16.7MHz, DIGITAL SIGNAL PROCESSING, 1K PROGRAM & 512 WORD	ANALOG DEVICES LTD	ADSP-2115KP-66
IC39 to IC43	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)
IC44	28469/619	IC-DIGITAL FIELDPROG-GATE-ARRAY FX740... 80MHz, 40 MACROCELLS, 3.3V/5V O/P, tPD 10nS, BOUNDARY SCAN &	ALTERA (US)	EPX740LC68-10
IC45	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)
IC46	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)
IC47	28467/159	IC-MICRO DIGIT/SGNL PROCESSR, ADSP2115... 16.7MHz, DIGITAL SIGNAL PROCESSING, 1K PROGRAM & 512 WORD	ANALOG DEVICES LTD	ADSP-2115KP-66
IC48 to IC52	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)
IC53	28469/619	IC-DIGITAL FIELDPROG-GATE-ARRAY FX740... 80MHz, 40 MACROCELLS, 3.3V/5V O/P, tPD 10nS, BOUNDARY SCAN &	ALTERA (US)	EPX740LC68-10
IC54	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)
IC55	28467/157	IC-MICRO STATIC-RAM, 32K x 8 BIT, KM68257B... 15nS ACCESS, STANDBY CURRENT 40mA MAX, J-LEADS, CMOS,	INTEG DEVICE TECH	IDT71256SA-15Y(TUBE)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A8 Complex modem and IF (contd.)				
IC56	28461/045	IC-ANALOGUE A/D CONVERTER AD871... +/-5V, 12 BIT, 5MHz, ON-CHIP TRACK & HOLD, VOLTAGE REF, DIFF	ANALOG DEVICES LTD	AD871JE
IC57	28469/623	IC-DIGITAL FIELDPROG-GATE-ARRAY XC4003A... 3000 GATES, 100 LOGIC BLOCKS, 77 INPUT/OUTPUTS, 3.2K	XILINX (USA)	XC4003A-6PQ100C
IC58	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC59	28461/898	IC-ANALOGUE D/A-CONVERTER 7528... 8 INPUT, DUAL, 8-BIT, BUFFERED, MULTIPLYING, CMOS, 20 PIN,	ANALOG DEVICES LTD	AD7528JR
IC60	28461/505	IC-ANALOGUE OPERATIONAL AMP OP482... QUAD, JFET INPUT, LOW SUPPLY CURRENT, SLEW RATE 7V/uS MIN,	ANALOG DEVICES LTD	OP-482GS
IC61	28469/624	IC-DIGITAL FIELDPROG-GATE-ARRAY XC4005... 5000 GATES, 196 LOGIC BLOCKS, 112 INPUT/OUTPUTS, 6.2K	XILINX (USA)	XC4005-5PQ160C
IC62	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC63	28461/046	IC-ANALOGUE SWITCH DG540... QUAD, 20mA RF VIDEO T-SWITCH, BANDWIDTH 500MHz, ISOLATION 80dB @ 5MHz,	TEMIC UK LTD	DG540DN
IC64	28461/046	IC-ANALOGUE SWITCH DG540... QUAD, 20mA RF VIDEO T-SWITCH, BANDWIDTH 500MHz, ISOLATION 80dB @ 5MHz,	TEMIC UK LTD	DG540DN
IC65	28461/042	IC-ANALOGUE COMPARATOR LT1016... I/P-OFFSET 3mV MAX, RESPONSE TIME 14nS MAX, TTL, 8 PIN,	MAXIM INTEG PRODUCTS	LT1016CS8
IC66	28531/015	RF-MIXER DOUBLE-BALANCED, DIODE RING, RMS-2... 5-1000MHz, 50R 1 dBm RF-1dB COMPRESS, 9.5 dB LOSS,	MINI-CIRCUITS	RMS-2
IC67	23642/950	FILTER BANDPASS, PCB-MOUNT, SAW, 50R, 70MHz, 10.4MHz PASSBAND @ 3dB, 15.4MHz STOPBAND @ 35dB,	SIEMENS LTD	OFWX6950M
IC68	28531/081	RF-MIXER DOUBLE-BALANCED, DIODE RING, RMS-1... 0.5 - 500MHz, 50R 1 dBm RF-1dB COMPRESS, 8.5 dB LOSS,	MINI-CIRCUITS	RMS-1
IC69	28469/051	IC-DIGITAL INVERTER 74AC04... HEX, CMOS-ADVANCED, 14 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	74AC04SC
L1 to L3	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L4	23642/729	INDUCTOR-FIXED 0.18uH +/- 5% EPOXY-MOULD, 450mA 0R28 MAX, 30 Q @ 25.2 MHz, 400 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R18-J
L5	23642/729	INDUCTOR-FIXED 0.18uH +/- 5% EPOXY-MOULD, 450mA 0R28 MAX, 30 Q @ 25.2 MHz, 400 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R18-J
L6	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L7	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L9	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L10	23642/732	INDUCTOR-FIXED 0.82uH +/- 5% EPOXY-MOULD, 450mA 0R65 MAX, 30 Q @ 25.2 MHz, 140 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R82-J
L11	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L12	23642/732	INDUCTOR-FIXED 0.82uH +/- 5% EPOXY-MOULD, 450mA 0R65 MAX, 30 Q @ 25.2 MHz, 140 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R82-J
L13	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A8 Complex modem and IF (contd.)				
L14	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L15	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L16	23642/732	INDUCTOR-FIXED 0.82uH +/- 5% EPOXY-MOULD, 450mA 0R65 MAX, 30 Q @ 25.2 MHz, 140 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R82-J
L17	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L18	23642/732	INDUCTOR-FIXED 0.82uH +/- 5% EPOXY-MOULD, 450mA 0R65 MAX, 30 Q @ 25.2 MHz, 140 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R82-J
L19	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L20	23642/710	INDUCTOR-FIXED 3.9uH +/- 5% EPOXY-MOULD, 250mA 1R3 MAX, 30 Q @ 7.96 MHz, 55 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-3R9-J
L21	23642/733	INDUCTOR-FIXED 6.8uH +/- 5% EPOXY-MOULD, 180mA 1R8 MAX, 30 Q @ 7.96 MHz, 430 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-6R8-J
L22	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L23	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L24 to L26	23642/731	INDUCTOR-FIXED 0.33uH +/- 5% EPOXY-MOULD, 450mA 0R4 MAX, 30 Q @ 25.2 MHz, 300 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R33-J
L27 to L30	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L31	23642/731	INDUCTOR-FIXED 0.33uH +/- 5% EPOXY-MOULD, 450mA 0R4 MAX, 30 Q @ 25.2 MHz, 300 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R33-J
L32	23642/731	INDUCTOR-FIXED 0.33uH +/- 5% EPOXY-MOULD, 450mA 0R4 MAX, 30 Q @ 25.2 MHz, 300 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R33-J
L33	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L37	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L38 to L40	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L41	23642/731	INDUCTOR-FIXED 0.33uH +/- 5% EPOXY-MOULD, 450mA 0R4 MAX, 30 Q @ 25.2 MHz, 300 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R33-J
L42	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L44	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L46	23642/731	INDUCTOR-FIXED 0.33uH +/- 5% EPOXY-MOULD, 450mA 0R4 MAX, 30 Q @ 25.2 MHz, 300 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R33-J
L47	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L48	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
PLA	23437/061	CONNECTOR MULTIWAY, PCB HEADER, 10 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD10RP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A8 Complex modem and IF (contd.)				
PLB	23437/064	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD20RP
PLC	23437/062	CONNECTOR MULTIWAY, PCB HEADER, 14 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD14RP
PLD	23437/063	CONNECTOR MULTIWAY, PCB HEADER, 16 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD16RP
PLE	23437/061	CONNECTOR MULTIWAY, PCB HEADER, 10 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD10RP
PLF	23437/064	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD20RP
PLJK	23437/064	CONNECTOR MULTIWAY, PCB HEADER, 20 WAY, STAGGERED 2-ROW, 2.54mm PITCH, SURFACE MOUNTING, TIN PLATED	LUMBERG UK LTD	MICS/SMD20RP
R1	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R2	24811/194	RESISTOR-FIXED METAL-FILM 7K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-7K5-1%50ppm
R3	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R4	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R5	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R6	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R7	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R8	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R9	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R10	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R11	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R12	24811/164	RESISTOR-FIXED METAL-FILM 432R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-432R-1%50ppm
R13	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R14	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R15	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R16	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R17	24811/158	RESISTOR-FIXED METAL-FILM 243R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-243R-1%50ppm
R18	24811/158	RESISTOR-FIXED METAL-FILM 243R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-243R-1%50ppm

A8 Complex modem and IF (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R19	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R20	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R21	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R22	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R23	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R24	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R25	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R26	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R27	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R28	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R29	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R30	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R31	24811/164	RESISTOR-FIXED METAL-FILM 432R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-432R-1%50ppm
R32	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R33	24811/164	RESISTOR-FIXED METAL-FILM 432R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-432R-1%50ppm
R34	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R35	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R36	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R37	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R38	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R39	24811/132	RESISTOR-FIXED METAL-FILM 20R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20R-1%-50ppm
R40	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R41 to R43	24811/143	RESISTOR-FIXED METAL-FILM 56R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56R2-1%50ppm
R44	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R45	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R46	24811/163	RESISTOR-FIXED METAL-FILM 392R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-392R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A8	**Complex modem and IF (contd.)**			
R47	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R48	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R49	24811/143	RESISTOR-FIXED METAL-FILM 56R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56R2-1%50ppm
R50	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R51	24811/160	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301R-1%50ppm
R52	24811/131	RESISTOR-FIXED METAL-FILM 18R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-18R2-1%50ppm
R53	24811/160	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301R-1%50ppm
R54	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R55	24811/160	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301R-1%50ppm
R56	24811/194	RESISTOR-FIXED METAL-FILM 7K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-7K5-1%50ppm
R57	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R58	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R59	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R60	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R61	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R62	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R63	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R64	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R65	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R66	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R67	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R68	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R69	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R70	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R72	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R73	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm

A8 Complex modem and IF (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R74	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R75	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R76	24811/113	RESISTOR-FIXED METAL-FILM 3R32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3R32-1%50ppm
R77	24811/113	RESISTOR-FIXED METAL-FILM 3R32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3R32-1%50ppm
R78	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R79	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R80 to R83	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R84	24811/641	RESISTOR-FIXED METAL-FILM 2K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K0-0.1%-15
R85	24811/606	RESISTOR-FIXED METAL-FILM 1K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K0-0.1%-15
R86	24811/606	RESISTOR-FIXED METAL-FILM 1K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K0-0.1%-15
R87	24811/641	RESISTOR-FIXED METAL-FILM 2K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K0-0.1%-15
R88 to R97	24811/606	RESISTOR-FIXED METAL-FILM 1K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K0-0.1%-15
R98 to R101	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R102	24811/606	RESISTOR-FIXED METAL-FILM 1K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K0-0.1%-15
R103	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R104	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R105	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R106	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R107	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R108	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R109	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R110	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R111	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R112	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R113	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R114	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A8 Complex modem and IF (contd.)				
R115 to R118	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R119	24811/606	RESISTOR-FIXED METAL-FILM 1K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K0-0.1%-15
R120	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R121	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R122	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R123	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R124	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R125	24811/163	RESISTOR-FIXED METAL-FILM 392R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-392R-1%50ppm
R126	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R127	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R128	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R129	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R130 to R135	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R136	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R137	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R138	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R139	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R140	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R141	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R142 to R156	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R157	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R158	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R159	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R160	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R161	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R162 to R167	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm

A8 Complex modem and IF (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R168	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R169	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R170	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R171	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R172	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R173	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R174	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R175 to R180	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R181	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R182 to R184	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R185	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R186	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R187 to R191	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R192	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R193	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R194	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R195	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R196	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R197 to R200	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R201	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R202	24811/606	RESISTOR-FIXED METAL-FILM 1K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K0-0.1%-15
R203	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R204	24811/641	RESISTOR-FIXED METAL-FILM 2K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K0-0.1%-15
R205	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R206	24811/606	RESISTOR-FIXED METAL-FILM 1K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K0-0.1%-15
R207	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A8 Complex modem and IF (contd.)				
R208	24811/641	RESISTOR-FIXED METAL-FILM 2K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K0-0.1%-15
R209	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R212	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R213 to R227	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R228 to R233	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R236	24811/132	RESISTOR-FIXED METAL-FILM 20R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20R-1%-50ppm
R237	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R238	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R239	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R241	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R242	24811/113	RESISTOR-FIXED METAL-FILM 3R32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3R32-1%50ppm
R243	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R245 to R248	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R249	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R250	24811/160	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301R-1%50ppm
R251	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R252	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R253	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R254 to R258	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R260	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R265 to R275	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R277	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R278	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R280 to R287	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R290 to R292	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R300	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm

A8 Complex modem and IF (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R301	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R302	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R304	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R305	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R306	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R307	24811/132	RESISTOR-FIXED METAL-FILM 20R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20R-1%-50ppm
R308	24811/132	RESISTOR-FIXED METAL-FILM 20R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20R-1%-50ppm
R309	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R310	24811/113	RESISTOR-FIXED METAL-FILM 3R32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3R32-1%50ppm
R311	24811/132	RESISTOR-FIXED METAL-FILM 20R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20R-1%-50ppm
R312 to R314	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R315	24811/113	RESISTOR-FIXED METAL-FILM 3R32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3R32-1%50ppm
R316	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R317	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R318 to R320	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R321 to R324	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R325 to R327	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R328	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R329	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R330	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R331	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R332	24811/143	RESISTOR-FIXED METAL-FILM 56R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56R2-1%50ppm
R333 to R337	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R338	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
A8 Complex modem and IF (contd.)				
SKA to SKK	23445/501	CONNECTOR-RF MMCX-TYPE FEMALE, JACK, 50 OHMS, SURFACE MOUNTING, VERTICAL, DC-6GHz, GOLD PLATD	HUBER & SUHNER	82MMCX-S50-0-51
T1	23622/909	TRANSFORMER RF MATCHING, TURNS RATIO 1:1:1, MOULDED BODY, 7.62x6.86x5.84mm, INSERTION LOSS 3dB	MINI-CIRCUITS	T-622-KK81
TR1	28455/302	TRANSISTOR NPN BIPOLAR BCX54... 45V 130MHz 1W 1A 40hFE MIN @ 150mA, MARKING CODE BA, SURFACE	PHILIPS	BCX54
TR2	28435/229	TRANSISTOR PNP BIPOLAR BCX51... 45V 50MHz 1W 1A 40hFE @ 250mA, SURFACE MOUNTED, SOT-89, (12mm TAPE	PHILIPS	BCX51
TR3	28455/302	TRANSISTOR NPN BIPOLAR BCX54... 45V 130MHz 1W 1A 40hFE MIN @ 150mA, MARKING CODE BA, SURFACE	PHILIPS	BCX54
TR4	28435/229	TRANSISTOR PNP BIPOLAR BCX51... 45V 50MHz 1W 1A 40hFE @ 250mA, SURFACE MOUNTED, SOT-89, (12mm TAPE	PHILIPS	BCX51
TR5	28487/824	TRANSISTOR NPN BIPOLAR BFQ67... 10V 7.5GHz 300mW 50mA 100hFE @ 15mA, MARKING CODE V2, SURFACE	PHILIPS	BFQ67
TR6	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR7	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR8	28457/851	TRANSISTOR NPN BIPOLAR BFS17... 15V 1.3GHz 250mW 50mA 20hFE MIN @ 2mA, MARKING CODE E1, SURFACE	PHILIPS	BFS17
TR9	28457/851	TRANSISTOR NPN BIPOLAR BFS17... 15V 1.3GHz 250mW 50mA 20hFE MIN @ 2mA, MARKING CODE E1, SURFACE	PHILIPS	BFS17
TR10	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR11	28487/818	TRANSISTOR NPN BIPOLAR BFS20... 20V 450MHz 200mW 25mA 40hFE MIN @ 7mA, MARKING CODE G1, SURFACE	PHILIPS	BFS20
TR12	28487/824	TRANSISTOR NPN BIPOLAR BFQ67... 10V 7.5GHz 300mW 50mA 100hFE @ 15mA, MARKING CODE V2, SURFACE	PHILIPS	BFQ67
TR13	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR14	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
XL1	28312/302	CRYSTAL 10 MHz +/- 30 ppm, 16pF PARALLEL RESONANCE, 70R ESR MAX, STABILITY 50ppm/DEG.C,	IQD LTD	A143G-(TAPE)
XL2	23642/801	FILTER RFI-SUPPRESSION, 3A RATING, SURFACE MOUNT, MULTILAYER IMPEDER, 95R IMPEDANCE @ 10MHz, 0.04R	TDK UK LTD	HF50ACC-575032-T
XL3	23642/801	FILTER RFI-SUPPRESSION, 3A RATING, SURFACE MOUNT, MULTILAYER IMPEDER, 95R IMPEDANCE @ 10MHz, 0.04R	TDK UK LTD	HF50ACC-575032-T
XL4	23642/801	FILTER RFI-SUPPRESSION, 3A RATING, SURFACE MOUNT, MULTILAYER IMPEDER, 95R IMPEDANCE @ 10MHz, 0.04R	TDK UK LTD	HF50ACC-575032-T
XL5	23642/801	FILTER RFI-SUPPRESSION, 3A RATING, SURFACE MOUNT, MULTILAYER IMPEDER, 95R IMPEDANCE @ 10MHz, 0.04R	TDK UK LTD	HF50ACC-575032-T

AE1 Fractional-N control

When ordering, prefix circuit reference with AE1.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829-841	Complete unit		Issue 23
C1 to C3	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C4	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C5	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C6 to C8	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C9	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C10	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C11	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C12	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C13	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C14	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C15 to C17	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C18	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C19	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C20	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C21	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C22	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C24	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C25	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C26	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C27	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C28	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C29	26421/151	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-310-G-C0
C30	26421/151	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-310-G-C0
C31	26386/867	CAPACITOR-FIXED CERAMIC 2.2nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-222-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE1	**Fractional-N control (contd.)**			
C32	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C33	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C34	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C35	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C36	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C37	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C38	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C39	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C40	26421/153	CAPACITOR-FIXED ALUMINIUM 470uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-347-C-C0
C41 to C43	26421/151	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-310-G-C0
C47	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C48	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C49	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C50 to C54	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C55	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C56	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C57	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C58 to C60	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C61	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C62 to C65	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C66 to C69	26451/006	CAPACITOR-FIXED ALUMINIUM 22uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	RUBYCON CAPACITORS	16-REV-22
D1	28371/412	DIODE ZENER, BZX84-C5V1... 350mW 5.1V 5% 250mA MARKING CODE Z2, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V1
D2	28371/412	DIODE ZENER, BZX84-C5V1... 350mW 5.1V 5% 250mA MARKING CODE Z2, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V1
D3	28383/910	DIODE SMALL-SIGNAL, BAS28... DUAL, 330mW 75V 250mA ELECTRICALLY ISOLATED, MARKING CODE A61 OR JT,	PHILIPS	BAS28

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE1	**Fractional-N control (contd.)**			
D4	28349/032	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2820... 8V 1pF 340mVf @ 1mA, MARKNG CODE C0, LOW PROFILE, SURFACE	HEWLETT-PACKARD	HSMS-2820-L31
D5	28349/032	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2820... 8V 1pF 340mVf @ 1mA, MARKNG CODE C0, LOW PROFILE, SURFACE	HEWLETT-PACKARD	HSMS-2820-L31
D6	28383/910	DIODE SMALL-SIGNAL, BAS28... DUAL, 330mW 75V 250mA ELECTRICALLY ISOLATED, MARKING CODE A61 OR JT,	PHILIPS	BAS28
D7	28349/032	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2820... 8V 1pF 340mVf @ 1mA, MARKNG CODE C0, LOW PROFILE, SURFACE	HEWLETT-PACKARD	HSMS-2820-L31
D8	28349/032	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2820... 8V 1pF 340mVf @ 1mA, MARKNG CODE C0, LOW PROFILE, SURFACE	HEWLETT-PACKARD	HSMS-2820-L31
IC1	28466/393	IC-DIGITAL NAND-GATE 74HC132... 2 INPUT, QUAD, SCHMITT TRIGGER, CMOS-H/SPEED, 14 PIN,	PHILIPS	74HC132D
IC2	28462/431	IC-DIGITAL LATCH 74HCT373... OCTAL, TRANSPARENT WITH TRI-STATE BUS, CMOS-H/SPEED+TTL, 20 PIN,	PHILIPS	74HCT373D
IC3	28465/053	IC-DIGITAL DECODER/DEMULTIPLEX 74HCT138... 3 INPUT, 8 BIT, SINGLE, INVERTING, 3 BIT ADDRESS,	PHILIPS	74HCT138D
IC4	28467/161	IC-MICRO CONTROLLER, 80C652... 8 BIT, 16MHz, 256 BYTE RAM, I.IC BUS, DUPLEX UART, 4 x 8 BIT I/O	PHILIPS	P80C652FBA
IC6	28467/113	IC-MICRO CONTROLLER, 8584... INTERFACE, PARALLEL-BUS MICROCONTROLLER OR PROCESSOR TO	PHILIPS	PCF8584T
IC7	28469/542	IC-DIGITAL BUFFER/LINE-DRIVER 74ACT541... OCTAL, TRI-STATE, NON-INVERTING, CMOS-ADVANCED+TTL, 20	MOTOROLA INC.	MC74ACT541DW
IC8	28469/027	IC-DIGITAL INVERTER 74HCT14... HEX, SCHMITT-TRIGGER OPERATION, CMOS-H/SPEED+TTL, 14	PHILIPS	74HCT14D
IC9	28467/118	IC-MICRO STATIC-RAM, 32K x 8 BIT, 62256... 100nS, 100uA STANDBY CURRENT, 0.45in PITCH, CMOS, 28 PIN,	TOSHIBA (UK) LTD	TC55257BFL-10
IC10	28469/621	IC-DIGITAL ARRAY-LOGIC L5A1579... FRACTIONAL N CONTROL CHIP, 28 BIT BINARY, TO MI CUSTOM SPEC,	LSI LOGIC LTD	L5A1579
IC11	28469/568	IC-DIGITAL DIVIDER SP8400... DIVIDE BY 8/9, 1.5GHz PRESCALER, PHASE NOISE < 160dBc/Hz, 3 BIT A & 9	GEC PLESSEY SEMICOND	SP8400-KG-MPES
IC12	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC13	28466/414	IC-DIGITAL EXCLUSIVE-OR 74HC86... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC86D
IC15	28461/413	IC-ANALOGUE OPERATIONAL AMP TL074... QUAD, JFET INPUT, LOW NOISE, SLEW RATE 8V/uS MIN, GAIN	MOTOROLA INC.	TL074CD
IC16	28462/136	IC-DIGITAL FLIP-FLOP/D-TYPE 74HCT74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR,	PHILIPS	74HCT74D
IC17	28469/621	IC-DIGITAL ARRAY-LOGIC L5A1579... FRACTIONAL N CONTROL CHIP, 28 BIT BINARY, TO MI CUSTOM SPEC,	LSI LOGIC LTD	L5A1579
IC18	28469/568	IC-DIGITAL DIVIDER SP8400... DIVIDE BY 8/9, 1.5GHz PRESCALER, PHASE NOISE < 160dBc/Hz, 3 BIT A & 9	GEC PLESSEY SEMICOND	SP8400-KG-MPES
IC19	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC20	28466/414	IC-DIGITAL EXCLUSIVE-OR 74HC86... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC86D

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE1	**Fractional-N control (contd.)**			
L1 to L3	44291/049	WOUND-PART INDUCTOR, RING-CORE, 14 TURNS, UNMOUNTED.	AMETHYST DESIGNS LTD	AD5320
R2	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R3	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R4	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R5	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R6	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R7	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R8	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R9	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R10 to R17	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R18	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R19 to R30	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R31	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R32	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R33	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R34	24811/174	RESISTOR-FIXED METAL-FILM 1K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K1-1%50ppm
R35	24811/174	RESISTOR-FIXED METAL-FILM 1K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K1-1%50ppm
R36	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R37	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R38	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R39	24811/182	RESISTOR-FIXED METAL-FILM 2K43 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K43-1%50ppm
R40	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R41	24811/192	RESISTOR-FIXED METAL-FILM 6K19 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K19-1%50ppm
R42	24811/192	RESISTOR-FIXED METAL-FILM 6K19 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K19-1%50ppm

AE1 Fractional-N control (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R43 to R46	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R47	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R48 to R59	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R60	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R61	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R62	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R63	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R64	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R66	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R67	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R68	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R69	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R70	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R71	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R72 to R76	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R78	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R79	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R80	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R81	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R82	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R83	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R84 to R88	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R89	24811/211	RESISTOR-FIXED METAL-FILM 39K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-39K2-1%50ppm
R90	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R91	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R92	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE1	**Fractional-N control (contd.)**			
R93	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
TR1	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR2	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR3	28487/810	TRANSISTOR NPN BIPOLAR BSV52... 12V 400MHz 250mW 100mA MARKING CODE B2, SURFACE MOUNTED, SOT-23,	PHILIPS	BSV52
TR4	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR5	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR6	28457/854	TRANSISTOR PNP BIPOLAR BFT93... 12V 5GHz 200mW 35mA MARKING CODE X1, SURFACE MOUNTED, SOT-23,	PHILIPS	BFT93
TR7	28457/852	TRANSISTOR PNP BIPOLAR BSR15... 40V 200MHz 300mW 600mA MARKING CODE CH/T7p, SURFACE MOUNTED,	PHILIPS	BSR15
TR7	28457/854	TRANSISTOR PNP BIPOLAR BFT93... 12V 5GHz 200mW 35mA MARKING CODE X1, SURFACE MOUNTED, SOT-23,	PHILIPS	BFT93
TR8	28457/852	TRANSISTOR PNP BIPOLAR BSR15... 40V 200MHz 300mW 600mA MARKING CODE CH/T7p, SURFACE MOUNTED,	PHILIPS	BSR15
TR8	28457/854	TRANSISTOR PNP BIPOLAR BFT93... 12V 5GHz 200mW 35mA MARKING CODE X1, SURFACE MOUNTED, SOT-23,	PHILIPS	BFT93
TR9	28457/854	TRANSISTOR PNP BIPOLAR BFT93... 12V 5GHz 200mW 35mA MARKING CODE X1, SURFACE MOUNTED, SOT-23,	PHILIPS	BFT93

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number

AE2 1st LO synthesizer

When ordering, prefix circuit reference with AE2.

	44829-842	Complete unit	Issue 19	
C1	26386/893	CAPACITOR-FIXED CERAMIC 330nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 2220, NICKEL	SYFER TECHNOLOGY LTD	2220-J-050-0334K-X-T
C2	26386/893	CAPACITOR-FIXED CERAMIC 330nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 2220, NICKEL	SYFER TECHNOLOGY LTD	2220-J-050-0334K-X-T
C3	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C4	26421/106	CAPACITOR-FIXED ALUMINIUM 1uF +/-20% 50V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1H-KA-010-B
C5	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C6	26421/106	CAPACITOR-FIXED ALUMINIUM 1uF +/-20% 50V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1H-KA-010-B
C7	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C8	26451/006	CAPACITOR-FIXED ALUMINIUM 22uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	RUBYCON CAPACITORS	16-REV-22
C9	26451/006	CAPACITOR-FIXED ALUMINIUM 22uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	RUBYCON CAPACITORS	16-REV-22
C10	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C11	26421/106	CAPACITOR-FIXED ALUMINIUM 1uF +/-20% 50V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1H-KA-010-B
C12	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C13	26421/106	CAPACITOR-FIXED ALUMINIUM 1uF +/-20% 50V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1H-KA-010-B
C14	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C15 to C18	26386/893	CAPACITOR-FIXED CERAMIC 330nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 2220, NICKEL	SYFER TECHNOLOGY LTD	2220-J-050-0334K-X-T
C19 to C21	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C22	26386/820	CAPACITOR-FIXED CERAMIC 47pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-470-JP
C23	26386/820	CAPACITOR-FIXED CERAMIC 47pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-470-JP
C24	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C25	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C26	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C27	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C28	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C29	26386/885	CAPACITOR-FIXED CERAMIC 68nF 10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-683-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE2	**1st LO synthesizer (contd.)**			
C30	26386/871	CAPACITOR-FIXED CERAMIC 4.7nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-472-KP
C31	26386/885	CAPACITOR-FIXED CERAMIC 68nF 10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-683-KP
C32	26386/871	CAPACITOR-FIXED CERAMIC 4.7nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-472-KP
C33	26421/106	CAPACITOR-FIXED ALUMINIUM 1uF +/-20% 50V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1H-KA-010-B
C34	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C35	26421/106	CAPACITOR-FIXED ALUMINIUM 1uF +/-20% 50V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1H-KA-010-B
C36	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C37	26386/778	CAPACITOR-FIXED CERAMIC 22nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-223-K9-BBC
C38	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C39	26421/106	CAPACITOR-FIXED ALUMINIUM 1uF +/-20% 50V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1H-KA-010-B
C40	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C41	26421/106	CAPACITOR-FIXED ALUMINIUM 1uF +/-20% 50V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1H-KA-010-B
C42	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C43	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C44	26386/828	CAPACITOR-FIXED CERAMIC 220pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-221-JP
C45	26421/106	CAPACITOR-FIXED ALUMINIUM 1uF +/-20% 50V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1H-KA-010-B
C46	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C49	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C50	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C51	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C52	26386/955	CAPACITOR-FIXED CERAMIC 10pF +/-0.25pF 100V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-1K-100-GAW-TR
C53	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C54 to C58	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C59	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C60	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C61	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE2	**1st LO synthesizer (contd.)**			
C62	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C63 to C65	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C66	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C67	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C68	26386/820	CAPACITOR-FIXED CERAMIC 47pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-470-JP
C69	26386/820	CAPACITOR-FIXED CERAMIC 47pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-470-JP
D1	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D2	28371/303	DIODE ZENER, BZX84-C6V2... 350mW 6.2V 5% 250mA MARKING CODE Z4, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C6V2
D3 to D5	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D6	28371/303	DIODE ZENER, BZX84-C6V2... 350mW 6.2V 5% 250mA MARKING CODE Z4, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C6V2
D7 to D10	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D11	28372/301	DIODE ZENER, BZX84-C13... 350mW 13V 5% 250mA MARKING CODE Y3, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C13
D12	28381/530	DIODE VARIABLE CAPACITNCE, BB215... 30V 20mA 2.2pF @ 28V, CAPAC RATIO 7.6 MIN, MARKING GREEN, SURFACE	PHILIPS	BB215
D13	28381/530	DIODE VARIABLE CAPACITNCE, BB215... 30V 20mA 2.2pF @ 28V, CAPAC RATIO 7.6 MIN, MARKING GREEN, SURFACE	PHILIPS	BB215
IC1	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC2	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC3	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC4	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC5	28466/385	IC-DIGITAL NAND-GATE 74HCT00... 2 INPUT, QUAD, CMOS-H/SPEED+TTL, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HCT00D
IC6	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC7	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC8	28461/388	IC-ANALOGUE OPERATIONAL AMP LM324D... QUAD, GEN-PURPOSE, SLEW RATE 0.2V/uS MIN, GAIN BANDWIDTH	PHILIPS	LM324D
IC9	28461/447	IC-ANALOGUE MICROWAVE-AMP MSA-0886... 7.8V 36mA GAIN 22.5dB @1GHz, 25dB BNDWIDTH DC-5GHz, BIPOLAR,	HEWLETT-PACKARD	MSA-0886-TR1

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE2	**1st LO synthesizer (contd.)**			
IC10	28461/454	IC-ANALOGUE MICROWAVE-AMP MSA-0786... 4V 22mA GAIN 12.5dB @ 1GHz, 3dB BANDWIDTH DC-2GHz, BIPOLAR, 4	HEWLETT-PACKARD	MSA-0786-TR1
IC11	28469/522	IC-DIGITAL DIVIDER SP4902... DIVIDE BY 2, 2.54GHz, PRESCALER, ECL, 8 PIN, DUAL-IN-LINE.		
IC12	28461/454	IC-ANALOGUE MICROWAVE-AMP MSA-0786... 4V 22mA GAIN 12.5dB @ 1GHz, 3dB BANDWIDTH DC-2GHz, BIPOLAR, 4	HEWLETT-PACKARD	MSA-0786-TR1
L1	23642/512	INDUCTOR-FIXED 22uH +/- 5% EPOXY-MOULD, 110mA 3R7 MAX, 30 Q @ 2.5 MHz, 25 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-220-J
L2	23642/512	INDUCTOR-FIXED 22uH +/- 5% EPOXY-MOULD, 110mA 3R7 MAX, 30 Q @ 2.5 MHz, 25 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-220-J
L3	23642/706	INDUCTOR-FIXED 15uH +/- 5% EPOXY-MOULD, 130mA 2R8 MAX, 30 Q @ 2.52 MHz, 30 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-150-J
L4	23642/512	INDUCTOR-FIXED 22uH +/- 5% EPOXY-MOULD, 110mA 3R7 MAX, 30 Q @ 2.5 MHz, 25 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-220-J
L7 to L10	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% EPOXY-MOULD, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L11	23642/524	INDUCTOR-FIXED 1mH +/- 10% EPOXY-MOULD, 30mA 40R MAX, 30 Q @ 0.252 MHz, 2.5 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3613-T-102-K
L12	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% EPOXY-MOULD, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L13	23642/525	INDUCTOR-FIXED 680uH +/- 10% EPOXY-MOULD, 50mA 30R MAX, 30 Q @ 0.796 MHz, 3 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3613-T-681-K
R1	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R2	24811/217	RESISTOR-FIXED METAL-FILM 68K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68K1-1%50ppm
R3	24811/227	RESISTOR-FIXED METAL-FILM 182K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182K-1%50ppm
R4	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R5	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R6	24338/010	RESISTOR-FIXED METAL-GLAZE 470R +/- 5% 1W 100V 350 ppm/DEG.C, SURFACE MOUNTED, SIZE 2512, (12mm	VISHAY COMPONENTS	CR2512-470R-5%-P4
R8	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R9	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R10	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R11	24811/219	RESISTOR-FIXED METAL-FILM 82K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-82K5-1%50ppm
R12	24811/207	RESISTOR-FIXED METAL-FILM 27K4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27K4-1%50ppm
R13	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE2	**1st LO synthesizer (contd.)**			
R14	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R15	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R16	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R17	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R18	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R19	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R20	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R21	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R22	24811/144	RESISTOR-FIXED METAL-FILM 61R9 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-61R9-1%50ppm
R23	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R24	24811/144	RESISTOR-FIXED METAL-FILM 61R9 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-61R9-1%50ppm
R25	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R26 to R29	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R30	24811/158	RESISTOR-FIXED METAL-FILM 243R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-243R-1%50ppm
R31	24811/158	RESISTOR-FIXED METAL-FILM 243R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-243R-1%50ppm
R32	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R33 to R35	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R36	24811/172	RESISTOR-FIXED METAL-FILM 909R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-909R-1%50ppm
R37	24811/101	RESISTOR-FIXED METAL-FILM 1R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1R-1%-50ppm
R38	24811/170	RESISTOR-FIXED METAL-FILM 750R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-750R-1%50ppm
R39	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R40	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R41	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R42	24811/917	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-332R-1%
R43	24811/902	RESISTOR-FIXED METAL-FILM 16R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-16R2-1%
R44	24811/902	RESISTOR-FIXED METAL-FILM 16R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-16R2-1%

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE2	**1st LO synthesizer (contd.)**			
R45	24811/151	RESISTOR-FIXED METAL-FILM 121R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-121R-1%50ppm
R46	24811/908	RESISTOR-FIXED METAL-FILM 43R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-43R2-1%
R47	24811/906	RESISTOR-FIXED METAL-FILM 36R5 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-36R5-1%
R48	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R49	24811/140	RESISTOR-FIXED METAL-FILM 43R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-43R2-1%50ppm
R50	24811/909	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-51R1-1%
R51	24811/134	RESISTOR-FIXED METAL-FILM 24R3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-24R3-1%50ppm
R52	24811/113	RESISTOR-FIXED METAL-FILM 3R32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3R32-1%50ppm
R54	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R55	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R56	24811/151	RESISTOR-FIXED METAL-FILM 121R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-121R-1%50ppm
R57	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R58	24772/074	RESISTOR-FIXED METAL-FILM 1K1 +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-1K1-2%
SKD	23435/990	CONNECTOR SHORTING, SOCKET, 2 WAY, FOR 0.64mm SQ PINS, 2.54mm PITCH, 9.6mm HIGH, FREE MOUNTING,	BERG ELECTRONICS	65474-001
SKE	23435/990	CONNECTOR SHORTING, SOCKET, 2 WAY, FOR 0.64mm SQ PINS, 2.54mm PITCH, 9.6mm HIGH, FREE MOUNTING,	BERG ELECTRONICS	65474-001
TR1	28455/302	TRANSISTOR NPN BIPOLAR BCX54... 45V 130MHz 1W 1A 40hFE MIN @ 150mA, MARKING CODE BA, SURFACE	PHILIPS	BCX54
TR2	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE @ 2mA, NOISE 2dB @ 1KHz, MARKING CODE	PHILIPS	BC848B
TR3	28452/771	TRANSISTOR NPN BIPOLAR BC209C... 20V 150MHz 200mW 100mA 420hFE @ 2mA, TO-92, (TAPED EMITR FIRST).	PHILIPS	BC549C
TR4	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR5	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR6	28487/824	TRANSISTOR NPN BIPOLAR BFQ67... 10V 7.5GHz 300mW 50mA 100hFE @ 15mA, MARKING CODE V2, SURFACE	PHILIPS	BFQ67
TR7	28452/771	TRANSISTOR NPN BIPOLAR BC209C... 20V 150MHz 200mW 100mA 420hFE @ 2mA, TO-92, (TAPED EMITR FIRST).	PHILIPS	BC549C

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number

AE3 1st mixer

When ordering, prefix circuit reference with AE3.

	44829-843	Complete unit	Issue 09	
C1 to C5	26841/502	CAPACITOR-VARIABLE SAPPHIRE 0.6pF to 4.5pF 500V 350 ppm/DEG.C, +/-100ppm/DEG.C, HORIZONTAL-PC	MURATA ELECTRONICS	TTG12A4R5A
C6	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C7	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C8 to C10	26486/101	CAPACITOR-FIXED TANTALUM 1uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 1206, (TAPED).	VISHAY COMPONENTS	293D-105-X0-016-A-2T
C11	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C12	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C13	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C14	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C16 to C23	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
D1	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
IC1	28461/448	IC-ANALOGUE MICROWAVE-AMPLIFIER MSA-0386... 5V 35mA GAIN 12dB @ 1GHz, 3dB BANDWIDTH DC-2.4GHz,	HEWLETT-PACKARD	MSA-0386
IC2	28461/450	IC-ANALOGUE MICROWAVE-AMPLIFIER MSA-0486... 5.25V 50mA GAIN 8dB @ 1GHz, 3dB BANDWIDTH DC-3.2GHz,	HEWLETT-PACKARD	MSA-0486
IC3	28531/001	RF-MIXER DOUBLE-BALANCED, DIODE RING, M4G... 800-3500MHz, 50R 1 dBm RF-1dB COMPRESS, 8 dB LOSS,	M/A COM LTD	DR1/0487/23
L8	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% MOULDED-EPOXY, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L9	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% MOULDED-EPOXY, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L10	23642/533	INDUCTOR-FIXED 10uH +/- 5% MOULDED-EPOXY, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-100-J
R1	24773/249	RESISTOR-FIXED METAL-FILM 100R +/- 2% 250mW 250V 100 ppm/DEG.C, 1%-100R-ACCEPTABLE, AXIAL, (TAPED).	VISHAY COMPONENTS	EE.10-100R-G-T-1
R2	24773/247	RESISTOR-FIXED METAL-FILM 82R +/- 2% 250mW 250V 100 ppm/DEG.C, 1%-82R5-ACCEPTABLE, AXIAL, (LOOSE	VISHAY COMPONENTS	EE.10-82R-G-T-1
R3	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE3 1st mixer (contd.)				
R4	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R5 to R8	24811/916	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-301R-1%
R9	24811/903	RESISTOR-FIXED METAL-FILM 18R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-18R2-1%
R10	24811/903	RESISTOR-FIXED METAL-FILM 18R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-18R2-1%
R11	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R12	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
RLA	23486/101	RELAY MAGNETIC, DOUBLE-POLE CHANGEOVER, 5V COIL, 62R - CONTACTS 1A @ 28VDC, 9.5mmSQ, 9.6mm HIGH,	TELEDYNE LTD	172-5
RLB	23486/101	RELAY MAGNETIC, DOUBLE-POLE CHANGEOVER, 5V COIL, 62R - CONTACTS 1A @ 28VDC, 9.5mmSQ, 9.6mm HIGH,	TELEDYNE LTD	172-5
TR1	28435/241	TRANSISTOR PNP BIPOLAR BCX17... 45V 100MHz 425mW 500mA 100hFE MIN @ 100mA, MARKING CODE T1, SURFACE	PHILIPS	BCX17

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number

AE4 1st and 2nd IF, 2nd and 3rd mixers

When ordering, prefix circuit reference with AE4.

	44829-844	Complete unit	Issue 09	
C5	26386/869	CAPACITOR-FIXED CERAMIC 3.3nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-332-KP
C6	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C7	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C8	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C9	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C10	26386/827	CAPACITOR-FIXED CERAMIC 180pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-181-JP
C11	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C12 to C14	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C15	26343/784	CAPACITOR-FIXED CERAMIC 68pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-680-JP
C16 to C18	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C19	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C20	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C21	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C22 to C26	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C27 to C29	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C30	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C31	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C32	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C33	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C34	26386/820	CAPACITOR-FIXED CERAMIC 47pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-470-JP
D1	28371/735	DIODE ZENER, BZX84-C8V2... 350mW 8.2V 5% 250mA MARKING CODE Z7, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C8V2

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE4	**1st and 2nd IF, 2nd and 3rd mixers (contd.)**			
IC1	28461/447	IC-ANALOGUE MICROWAVE-AMP MSA-0886... 7.8V 36mA GAIN 22.5dB @1GHz, 25dB BNDWIDTH DC-5GHz, BIPOLAR,	HEWLETT-PACKARD	MSA-0886-TR1
IC2	28531/007	RF-MIXER DOUBLE-BALANCED, DIODE RING, SRA220... 0.05-2000MHz, 50R 4 dBm RF-1dB COMPRESS, 6 dB	MINI-CIRCUITS	SRA-220
IC3	28531/021	RF-MIXER DOUBLE-BALANCED, SL6440C... 150MHz MAX, 15 dBm RF-1dB COMPRESS, +30dBm INTERCEPT,		
L5	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% EPOXY-MOULD, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L6	44291/045	WOUND-PART INDUCTOR, 0.9uH, AIR-CORE, ON M4 x 0.5mm FORMER, 22.75 TURNS.	AMETHYST DESIGNS LTD	AD5317
L7	44291/045	WOUND-PART INDUCTOR, 0.9uH, AIR-CORE, ON M4 x 0.5mm FORMER, 22.75 TURNS.	AMETHYST DESIGNS LTD	AD5317
L8	23642/539	INDUCTOR-FIXED 0.03uH +/- 10% UNSCREENED, AIR-CORED, 2 PIN, 135 Q @ 100 MHz, 6.7mm x 4.3mm	TOKO (UK) LTD	E514GNE-150024S12
L9	23642/540	INDUCTOR-FIXED 0.05uH +/- 10% UNSCREENED, AIR-CORED, 2 PIN, 155 Q @ 100 MHz, 6.7mm x 4.3mm	TOKO (UK) LTD	E514GNE-150014S14
L10	23642/540	INDUCTOR-FIXED 0.05uH +/- 10% UNSCREENED, AIR-CORED, 2 PIN, 155 Q @ 100 MHz, 6.7mm x 4.3mm	TOKO (UK) LTD	E514GNE-150014S14
L11	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L12	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
PLD	23435/990	CONNECTOR SHORTING, SOCKET, 2 WAY, FOR 0.64mm SQ PINS, 2.54mm PITCH, 9.6mm HIGH, FREE MOUNTING,	BERG ELECTRONICS	65474-001
R1	24811/901	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-10R-1%
R2	24811/147	RESISTOR-FIXED METAL-FILM 82R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-82R5-1%50ppm
R3	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R4	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R5	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R6	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R7	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R8	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R9	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R10	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE4	**1st and 2nd IF, 2nd and 3rd mixers (contd.)**			
R11	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R12	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R13	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R14	24811/156	RESISTOR-FIXED METAL-FILM 200R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-200R-1%50ppm
R15	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R16	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R17	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R19	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R20	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R21	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R22	24811/101	RESISTOR-FIXED METAL-FILM 1R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1R-1%-50ppm
R23	24772/039	RESISTOR-FIXED METAL-FILM 39R +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-39R-2%
R24	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
TR1	28457/851	TRANSISTOR NPN BIPOLAR BFS17... 15V 1.3GHz 250mW 50mA 20hFE MIN @ 2mA, MARKING CODE E1, SURFACE	PHILIPS	BFS17
TR2	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR3	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369

AE4/2 1st and 2nd IF, 2nd and 3rd mixers

When ordering, prefix circuit reference with AE4/2.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44830-096	Complete unit	Issue 02	
C5	26386/869	CAPACITOR-FIXED CERAMIC 3.3nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-332-KP
C6	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C7	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C8	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C9	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C10	26386/827	CAPACITOR-FIXED CERAMIC 180pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-181-JP
C11	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C12 to C14	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C15	26343/784	CAPACITOR-FIXED CERAMIC 68pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-680-JP
C16 to C18	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C19	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C20	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C21	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C22 to C26	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C27 to C29	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C30	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C31	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C32	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C33	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C34	26386/820	CAPACITOR-FIXED CERAMIC 47pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-470-JP
D1	28371/735	DIODE ZENER, BZX84-C8V2... 350mW 8.2V 5% 250mA MARKING CODE Z7, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C8V2

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE4/2 1st and 2nd IF, 2nd and 3rd mixers (contd.)				
IC1	28461/447	IC-ANALOGUE MICROWAVE-AMP MSA-0886... 7.8V 36mA GAIN 22.5dB @1GHz, 25dB BNDWIDTH DC-5GHz, BIPOLAR,	HEWLETT-PACKARD	MSA-0886-TR1
IC2	28531/007	RF-MIXER DOUBLE-BALANCED, DIODE RING, SRA220... 0.05-2000MHz, 50R 4 dBm RF-1dB COMPRESS, 6 dB	MINI-CIRCUITS	SRA-220
IC3	28531/021	RF-MIXER DOUBLE-BALANCED, SL6440C... 150MHz MAX, 15 dBm RF-1dB COMPRESS, +30dBm INTERCEPT,		
FL1	23642/953	FILTER BANDPASS, PCB-MOUNT, CERAMIC, 1355MHz 300MHz BANDWIDTH @ 3dB, 50 OHM, 4 POLE.	RACAL-MESL LTD	LQ2425
L5	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% EPOXY-MOULD, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L6	44291/045	WOUND-PART INDUCTOR, 0.9uH, AIR-CORE, ON M4 x 0.5mm FORMER, 22.75 TURNS.	AMETHYST DESIGNS LTD	AD5317
L7	44291/045	WOUND-PART INDUCTOR, 0.9uH, AIR-CORE, ON M4 x 0.5mm FORMER, 22.75 TURNS.	AMETHYST DESIGNS LTD	AD5317
L8	23642/539	INDUCTOR-FIXED 0.03uH +/- 10% UNSCREENED, AIR-CORED, 2 PIN, 135 Q @ 100 MHz, 6.7mm x 4.3mm	TOKO (UK) LTD	E514GNE-150024S12
L9	23642/540	INDUCTOR-FIXED 0.05uH +/- 10% UNSCREENED, AIR-CORED, 2 PIN, 155 Q @ 100 MHz, 6.7mm x 4.3mm	TOKO (UK) LTD	E514GNE-150014S14
L10	23642/540	INDUCTOR-FIXED 0.05uH +/- 10% UNSCREENED, AIR-CORED, 2 PIN, 155 Q @ 100 MHz, 6.7mm x 4.3mm	TOKO (UK) LTD	E514GNE-150014S14
L11	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L12	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
R1	24811/901	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-10R-1%
R2	24811/147	RESISTOR-FIXED METAL-FILM 82R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-82R5-1%50ppm
R3	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R4	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R5	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R6	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R7	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R8	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R9	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R10	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE4/2 1st and 2nd IF, 2nd and 3rd mixers contd.				
R11	24811/201	RESISTOR-FIXED METAL-FILM 5K +/- 1% 250mW 200V 50 ppm/DEG.C. SURFACE MOUNTED. SIZE MINI-MELF 3mm	[illegible]	[illegible]
R12	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C. SURFACE MOUNTED. SIZE MINI-MELF	[illegible]	[illegible]
R13	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C. SURFACE MOUNTED. SIZE MINI-MELF	[illegible]	[illegible]
R14	24811/156	RESISTOR-FIXED METAL-FILM 200R +/- 1% 250mW 200V 50 ppm/DEG.C. SURFACE MOUNTED. SIZE MINI-MELF	[illegible]	[illegible]
R15	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C. SURFACE MOUNTED. SIZE MINI-MELF 3mm	[illegible]	[illegible]
R16	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C. SURFACE MOUNTED. SIZE MINI-MELF	[illegible]	[illegible]
R17	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C. SURFACE MOUNTED. SIZE MINI-MELF	[illegible]	[illegible]
R19	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C. SURFACE MOUNTED. SIZE MINI-MELF 3mm	[illegible]	[illegible]
R20	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C. SURFACE MOUNTED. SIZE MINI-MELF	[illegible]	[illegible]
R21	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C. SURFACE MOUNTED. SIZE MINI-MELF	[illegible]	[illegible]
R22	24811/101	RESISTOR-FIXED METAL-FILM [illegible]R +/- 1% 250mW 200V 50 ppm/DEG.C. SURFACE MOUNTED. SIZE MINI-MELF 3mm	[illegible]	[illegible]
R23	24772/039	RESISTOR-FIXED METAL-FILM 39R +/- 2% 125mW 150V 100 ppm/DEG.C. AXIAL (TAPED).	[illegible]	[illegible]
R24	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C. SURFACE MOUNTED. SIZE MINI-MELF 3mm	[illegible]	[illegible]
TR1	28457/851	TRANSISTOR NPN BIPOLAR BFS17... 15V 1.0GHz 250mW 50mA 20hFE MIN @ 2mA. MARKING CODE E3. SURFACE	PHILIPS	BFS17
TR2	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA. MARKING CODE *J	PHILIPS	MBT2369
TR3	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA. MARKING CODE *J	PHILIPS	MBT2369

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number

AE5 2nd and 3rd LO

When ordering, prefix circuit reference with AE5.

	44829-845	Complete unit	Issue 15	
C1 to C3	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C4	26386/982	CAPACITOR-FIXED CERAMIC 2.2uF -20/+80% 16V Y5V MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	TDK UK LTD	CC1206C-Y5V-225Z-T&R
C5	26386/982	CAPACITOR-FIXED CERAMIC 2.2uF -20/+80% 16V Y5V MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	TDK UK LTD	CC1206C-Y5V-225Z-T&R
C6	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C7	26582/427	CAPACITOR-FIXED POLYESTER 470nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-447/065
C8	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C9	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C10	26386/971	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-2R2-BAW-TR
C11	26343/758	CAPACITOR-FIXED CERAMIC 3.9pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-3R9-DP
C12	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C13	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C14	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C15	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C16	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C17	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C18	26343/755	CAPACITOR-FIXED CERAMIC 1.5pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-1R5-DP
C19	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C20	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C21	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C23	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C24 to C26	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C27	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C28	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C29	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE5	**2nd and 3rd LO (contd.)**			
C31	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C32	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C33	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C34	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C35	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C36	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C37	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C38	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C39	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C40	26421/143	CAPACITOR-FIXED ALUMINIUM 470uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-U-471-B
C41	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C42	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C43	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C44	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C45	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C46	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C48	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C49	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C50	26386/817	CAPACITOR-FIXED CERAMIC 27pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-270-JP
C51	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C52	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C53	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C54	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C55	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C56	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C57	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE5 2nd and 3rd LO (contd.)				
C58 to C60	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C61	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C62	26386/816	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-220-JP
C63	26386/816	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-220-JP
C64	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C65 to C67	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C68	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C69	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C70	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C71	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
D1	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D2	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D3	28381/530	DIODE VARIABLE CAPACITNCE, BB215... 30V 20mA 2.2pF @ 28V, CAPAC RATIO 7.6 MIN, MARKING GREEN, SURFACE	PHILIPS	BB215
D4	28381/341	DIODE VARIABLE CAPACITNCE, BBY40... 350mW 28V 20mA 4.3pF @ 25V, CAPAC RATIO 5.0 MIN, MARKING CODE S2,	PHILIPS	BBY40
IC1	28461/363	IC-ANALOGUE OPERATIONAL AMP NE5532... DUAL, LINEAR, SLEW-RATE 9V/uS TYP, MONOLITHIC, 8 PIN,	PHILIPS	NE5532N
IC2	28461/448	IC-ANALOGUE MICROWAVE-AMP MSA-0386... 5V 35mA GAIN 12dB @ 1GHz, 3dB BANDWIDTH DC-2.4GHz, BIPOLAR, 4	HEWLETT-PACKARD	MSA-0386-TR1
IC3	28461/450	IC-ANALOGUE MICROWAVE-AMP MSA-0486... 5.25V 50mA GAIN 8dB @ 1GHz, 3dB BANDWIDTH DC-3.2GHz, BIPOLAR,	HEWLETT-PACKARD	MSA-0486-TR1
IC4	28469/522	IC-DIGITAL DIVIDER SP4902... DIVIDE BY 2, 2.54GHz, PRESCALER, ECL, 8 PIN, DUAL-IN-LINE.		
IC5	28469/547	IC-DIGITAL DIVIDER SP4908... DIVIDE BY 8, 2.5GHz, PRESCALER, ECL, 8 PIN, DUAL-IN-LINE.		
IC6	28531/021	RF-MIXER DOUBLE-BALANCED, SL6440C... 150MHz MAX, 15 dBm RF-1dB COMPRESS, +30dBm INTERCEPT,		
IC7	28464/173	IC-DIGITAL COUNTER 74AC161... 4 INPUT, 4 BIT, SINGLE, BINARY, SYNCHRONOUS, PRESETTABLE + RESET,	NAT. SEMICONDUCTOR	74AC161SC
IC8	28462/146	IC-DIGITAL FLIP-FLOP/D-TYPE 74AC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-ADVANCED,	NAT. SEMICONDUCTOR	74AC74SC
IC9	28466/394	IC-DIGITAL NAND-GATE 74AC00... 2 INPUT, QUAD, CMOS-ADVANCED, 14 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	74AC00SC

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE5 2nd and 3rd LO (contd.)				
IC10	28461/411	IC-ANALOGUE OPERATIONAL AMP TL071... SINGLE, JFET INPUT, LOW NOISE, 8 PIN, SMALL-OUTLINE.	MOTOROLA INC.	TL071CD
L1	23642/333	INDUCTOR-FIXED 470uH +/- 10% SCREENED, EPOXY-MOULD, 310mA 3R3 MAX, 90 Q @ 0.79 MHz, 3 MHz	VISHAY COMPONENTS	VL471K
L2	23642/325	INDUCTOR-FIXED 100uH +/- 10% SCREENED, EPOXY-MOULD, 500mA 1R3 MAX, 80 Q @ 2.5 MHz, 7 MHz	VISHAY COMPONENTS	VL101K
L3	23642/333	INDUCTOR-FIXED 470uH +/- 10% SCREENED, EPOXY-MOULD, 310mA 3R3 MAX, 90 Q @ 0.79 MHz, 3 MHz	VISHAY COMPONENTS	VL471K
L4 to L10	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% EPOXY-MOULD, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L11	23642/510	INDUCTOR-FIXED 0.1uH +/- 5% EPOXY-MOULD, 450mA 0R44 MAX, 28 Q @ 100 MHz, 700 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R10-J
L12	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% EPOXY-MOULD, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L13	23642/536	INDUCTOR-FIXED 0.33uH +/- 20% EPOXY-MOULD, 450mA 0R4 MAX, 30 Q @ 25.2 MHz, 300 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R33-M
L14	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L15	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L16	23642/532	INDUCTOR-FIXED 0.22uH +/- 20% EPOXY-MOULD, 450mA 0R32 MAX, 30 Q @ 25.2 MHz, 350 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R22-M
L17	23642/516	INDUCTOR-FIXED 0.022uH +/- 10% EPOXY-MOULD, 450mA 0R2 MAX, 23 Q @ 100 MHz, 1.7K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-022-K
R1	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R2	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R3	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R4	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R5	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R6	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R7	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R8	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R9	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R10	24811/133	RESISTOR-FIXED METAL-FILM 22R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22R1-1%50ppm
R11	24772/049	RESISTOR-FIXED METAL-FILM 100R +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-100R-2%

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE5 2nd and 3rd LO (contd.)				
R12	24811/901	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-10R-1%
R13	24811/905	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-33R2-1%
R14	24772/061	RESISTOR-FIXED METAL-FILM 330R +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-330R-2%
R15	24772/057	RESISTOR-FIXED METAL-FILM 220R +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-220R-2%
R16	24338/006	RESISTOR-FIXED METAL-GLAZE 220R +/- 5% 1W 100V 350 ppm/DEG.C, SURFACE MOUNTED, SIZE 2512, (12mm	VISHAY COMPONENTS	CR2512-220R-5%-P4
R17	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R18	24811/904	RESISTOR-FIXED METAL-FILM 24R3 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-24R3-1%
R19	24811/906	RESISTOR-FIXED METAL-FILM 36R5 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-36R5-1%
R20	24811/904	RESISTOR-FIXED METAL-FILM 24R3 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-24R3-1%
R21	24338/003	RESISTOR-FIXED METAL-GLAZE 120R +/- 5% 1W 100V 350 ppm/DEG.C, SURFACE MOUNTED, SIZE 2512, (12mm	VISHAY COMPONENTS	CR2512-120R-5%-P4
R22	24811/909	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-51R1-1%
R24	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R25	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R26	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R27	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R28	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R29 to R32	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R33	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R34	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R35	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R36	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R37	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R38	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R39	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R40	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R41	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE5	**2nd and 3rd LO (contd.)**			
R42	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R43	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R44	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R45 to R48	24811/203	RESISTOR-FIXED METAL-FILM 18K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-18K2-1%50ppm
R49	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R50	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R51	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R52	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R53	24811/195	RESISTOR-FIXED METAL-FILM 8K25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K25-1%50ppm
R54	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R55	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R56	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R57	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R58	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R59	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R60	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R61	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R62	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R63	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R64	24811/195	RESISTOR-FIXED METAL-FILM 8K25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K25-1%50ppm
R65	24811/187	RESISTOR-FIXED METAL-FILM 3K92 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K92-1%50ppm
R66	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R67	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R68	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R69	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R70	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE5 2nd and 3rd LO (contd.)				
R71	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R72	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R74	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R75	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R76	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R77	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R78	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
SKC	23435/990	CONNECTOR SHORTING, SOCKET, 2 WAY, FOR 0.64mm SQ PINS, 2.54mm PITCH, 9.6mm HIGH, FREE MOUNTING,	BERG ELECTRONICS	65474-001
SKSKF	23435/990	CONNECTOR SHORTING, SOCKET, 2 WAY, FOR 0.64mm SQ PINS, 2.54mm PITCH, 9.6mm HIGH, FREE MOUNTING,	BERG ELECTRONICS	65474-001
TR1	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR2 to TR8	28457/851	TRANSISTOR NPN BIPOLAR BFS17... 15V 1.3GHz 250mW 50mA 20hFE MIN @ 2mA, MARKING CODE E1, SURFACE	PHILIPS	BFS17
XL1	28311/974	CRYSTAL 80.0004 MHz +/- 10 ppm, SERIES RESONANCE, 60R ESR MAX, 5th OVERTONE, METAL HOLDER, SOLDER OR	IQD LTD	80.0004M10/10/-5+70S

AE6 Spectrum analyzer

When ordering, prefix circuit reference with AE6.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829-846	Complete unit	Issue 19	
C1 to C3	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C4	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C5	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C6	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C7	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C8 to C12	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C13	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C14	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C15	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C16	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C17	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C18	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C19	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C20	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C21	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C22	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C23	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C24	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C25	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C26	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C27	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C28	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C29	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6	**Spectrum analyzer (contd.)**			
C30 to C33	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C34	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C35	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C36	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C37	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C38	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C39 to C41	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C42	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C43	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C44	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C45 to C47	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C48	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C49	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C50	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C51	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C52	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C53	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C54	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C55	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C56	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C57	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C58	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C59 to C64	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C65	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C66	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C67	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6	**Spectrum analyzer (contd.)**			
C68	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C69	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C70	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C71	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C72 to C74	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C75	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C76 to C84	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C85	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C86	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C87	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C88 to C94	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C101	26386/823	CAPACITOR-FIXED CERAMIC 82pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-820-JP
C102	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C103	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C104	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C105	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C106	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C107	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C108	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C109	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C110	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C111	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C112	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C113 to C123	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C127 to C131	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C132	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6	**Spectrum analyzer (contd.)**			
C133	26386/871	CAPACITOR-FIXED CERAMIC 4.7nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-472-KP
C134	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C135 to C137	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C138 to C140	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C141 to C180	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C181 to C183	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C184	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C185 to C190	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C191	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
D1 to D7	28383/931	DIODE PIN, BAR14-1... DUAL, 140mW 100V 100mA 0.5pF 1.25Vf @ 100mA, IN SERIES, MARKING CODE L7,	SIEMENS LTD	BAR14-1-E6327
D9 to D18	28381/531	DIODE VARIABLE CAPACITNCE, BBY31... 28V 20mA 2pF @ 28V, CAPAC RATIO 9.7 TYP, MARKING CODE S1, SURFACE	PHILIPS	BBY31
D19 to D22	28335/670	DIODE BAND SWITCHING, BAT18... 35V 100mA 1pF MAX @ 20V, 1.2Vf @ 100mA, MARKING CODE A2, SURFACE	PHILIPS	BAT18/T1
D23 to D27	28383/931	DIODE PIN, BAR14-1... DUAL, 140mW 100V 100mA 0.5pF 1.25Vf @ 100mA, IN SERIES, MARKING CODE L7,	SIEMENS LTD	BAR14-1-E6327
D28	28335/670	DIODE BAND SWITCHING, BAT18... 35V 100mA 1pF MAX @ 20V, 1.2Vf @ 100mA, MARKING CODE A2, SURFACE	PHILIPS	BAT18/T1
D29	28335/670	DIODE BAND SWITCHING, BAT18... 35V 100mA 1pF MAX @ 20V, 1.2Vf @ 100mA, MARKING CODE A2, SURFACE	PHILIPS	BAT18/T1
D31	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D32	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D33 to D40	28335/670	DIODE BAND SWITCHING, BAT18... 35V 100mA 1pF MAX @ 20V, 1.2Vf @ 100mA, MARKING CODE A2, SURFACE	PHILIPS	BAT18/T1
D41 to D43	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D44	28371/412	DIODE ZENER, BZX84-C5V1... 350mW 5.1V 5% 250mA MARKING CODE Z2, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V1
IC1 to IC10	28461/886	IC-ANALOGUE LIMITING-AMPLIFIER SL1613... 9V 20mA 8 PIN, SMALL-OUTLINE.		
IC11	28461/413	IC-ANALOGUE OPERATIONAL AMP TL074... QUAD, JFET INPUT, LOW NOISE, SLEW RATE 8V/uS MIN, GAIN	MOTOROLA INC.	TL074CD
IC12	28461/727	IC-ANALOGUE VOLTAGE-REGULATOR LM337T... 37V 1.5A NEGATIVE ADJUSTABLE, LINEAR, MONOLITHIC, 3 PIN,	NAT. SEMICONDUCTOR	LM337T

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6	**Spectrum analyzer (contd.)**			
IC13 to IC15	28461/413	IC-ANALOGUE OPERATIONAL AMP TL074... QUAD, JFET INPUT, LOW NOISE, SLEW RATE 8V/uS MIN, GAIN	MOTOROLA INC.	TL074CD
IC16	28461/885	IC-ANALOGUE D/A-CONVERTER TDA8444... 18V 10mA I.IC BUS CONTROL OF 8x6 BIT CONVERTERS, CMOS, 16 PIN,	PHILIPS	TDA8444-N2
IC17	28467/111	IC-MICRO PERIPHERAL, PCF8574... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 8 DEVICE ADDRESS	PHILIPS	PCF8574T
L1	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L2	23642/555	INDUCTOR-FIXED 10uH +/- 10% COATED-LACQUER, MINIATURE, 470mA 0R9 MAX, 45 Q @ 7.9 MHz, 45 MHz	MEGGITT ELECTRONICS	C11-406/8/27520/006
L3	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L4	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L5	23642/555	INDUCTOR-FIXED 10uH +/- 10% COATED-LACQUER, MINIATURE, 470mA 0R9 MAX, 45 Q @ 7.9 MHz, 45 MHz	MEGGITT ELECTRONICS	C11-406/8/27520/006
L6	23642/555	INDUCTOR-FIXED 10uH +/- 10% COATED-LACQUER, MINIATURE, 470mA 0R9 MAX, 45 Q @ 7.9 MHz, 45 MHz	MEGGITT ELECTRONICS	C11-406/8/27520/006
L7	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L8	23642/555	INDUCTOR-FIXED 10uH +/- 10% COATED-LACQUER, MINIATURE, 470mA 0R9 MAX, 45 Q @ 7.9 MHz, 45 MHz	MEGGITT ELECTRONICS	C11-406/8/27520/006
L9	23642/555	INDUCTOR-FIXED 10uH +/- 10% COATED-LACQUER, MINIATURE, 470mA 0R9 MAX, 45 Q @ 7.9 MHz, 45 MHz	MEGGITT ELECTRONICS	C11-406/8/27520/006
L10	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L11 to L21	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L24 to L27	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L28 to L39	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L41	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L42	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
R1	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R2	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R3	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R4	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R5	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6	**Spectrum analyzer (contd.)**			
R6	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R7	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R8	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R9	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R10	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R11	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R12	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R13	24811/168	RESISTOR-FIXED METAL-FILM 619R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-619R-1%50ppm
R14	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R15	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R16	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R17	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R18	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R19	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R20	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R21	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R22	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R23	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R24	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R25	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R26	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R27	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R28	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R29	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R30	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R31	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6	**Spectrum analyzer (contd.)**			
R32	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R33	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R34	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R35	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R36	24811/168	RESISTOR-FIXED METAL-FILM 619R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-619R-1%50ppm
R37	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R38	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R39	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R40	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R41	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R42	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R43	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R44	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R45	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R46	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R47	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R48	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R49	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R50	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R51	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R52	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R53	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R54	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R55	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R56	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R57	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6	**Spectrum analyzer (contd.)**			
R58	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R59	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R61	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R64	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R65	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R66	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R67	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R68	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R73	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R74	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R75	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R77	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R78	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R79 to R83	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R84 to R88	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R89	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R90	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R92 to R96	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R97	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R98	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R100	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R102 to R121	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R122	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R123	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R124 to R131	24811/145	RESISTOR-FIXED METAL-FILM 68R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68R1-1%50ppm
R132	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6	**Spectrum analyzer (contd.)**			
R133	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R134	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R135	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R136	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R137	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R138	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R139	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R140	25748/566	RESISTOR-VARIABLE CERMET LINEAR, 10K 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/103
R141	25748/570	RESISTOR-VARIABLE CERMET LINEAR, 50K 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/503
R142	24811/209	RESISTOR-FIXED METAL-FILM 33K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-1%50ppm
R144	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R145	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R146	24811/208	RESISTOR-FIXED METAL-FILM 30K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-30K1-1%50ppm
R147	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R148	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R149	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R151	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R152	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R153	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R154	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R155	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R156	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R157	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R158	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R159	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R160	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6	**Spectrum analyzer (contd.)**			
R161	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R162	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R163	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R164	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R165	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R166	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R167	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R168	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R169	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R170	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R171	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R172	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R173	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R174	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R175	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R176	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R177	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R178	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R179	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R180	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R181	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R182	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R183	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R184	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R185	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R186	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6	**Spectrum analyzer (contd.)**			
R187	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R188 to R195	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R196	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R197	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R198	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R199 to R201	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R202	24811/207	RESISTOR-FIXED METAL-FILM 27K4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27K4-1%50ppm
R203	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R204	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R205	24811/232	RESISTOR-FIXED METAL-FILM 301K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301K-1%50ppm
R206	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R207	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R208	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R209	24811/232	RESISTOR-FIXED METAL-FILM 301K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301K-1%50ppm
R210	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R211	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R212	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R213	24811/232	RESISTOR-FIXED METAL-FILM 301K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301K-1%50ppm
R214	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R215	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R216	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R217	24811/232	RESISTOR-FIXED METAL-FILM 301K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301K-1%50ppm
R218	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R219	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R220	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R221	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6 Spectrum analyzer (contd.)				
R222	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R223	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R224	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R225	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R226	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R227	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R228	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R229	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R230	24811/147	RESISTOR-FIXED METAL-FILM 82R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-82R5-1%50ppm
R231	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R232	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R233	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R234	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R235	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R236	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R237	24811/151	RESISTOR-FIXED METAL-FILM 121R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-121R-1%50ppm
R238	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R239 to R242	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R243 to R247	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R248	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R249	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R250	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R251	24772/117	RESISTOR-FIXED METAL-FILM 68K +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-68K-2%
R252	24772/097	RESISTOR-FIXED METAL-FILM 10K +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-10K-2%

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6 Spectrum analyzer (contd.)				
T1	43590/236	WOUND-PART TRANSFORMER, RING-CORE, 10:10 TURNS, TWISTED BIFILAR WOUND, MOUNTED ON 6-PIN TOROID	AMETHYST DESIGNS LTD	AD5324
TR1 to TR26	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR27	28459/061	TRANSISTOR N-CHANNEL-DEPLETION JFET BSR56... 40V 250mW 50mA MARKING CODE M4, SURFACE MOUNTED,	PHILIPS	BSR56
TR28	28459/061	TRANSISTOR N-CHANNEL-DEPLETION JFET BSR56... 40V 250mW 50mA MARKING CODE M4, SURFACE MOUNTED,	PHILIPS	BSR56
TR29 to TR40	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
XL1 to XL5	28312/125	CRYSTAL 10.7 MHz +/- 20 ppm, 30pF SERIES RESONANCE, 25mH - 16R ESR MAX, HC-43/U, WIRE	C-MAC CRYSTALS LTD	C5742
XL6	23642/944	FILTER HF, PCB-MOUNT, CERAMIC, RADIAL, 10.7MHz, 280KHz B/WIDTH @ -3dB, 650KHz B/WIDTH @ -20dB, 330	MURATA ELECTRONICS	SFE10.7MA5-A
XL7	23642/945	FILTER HF, PCB-MOUNT, CERAMIC, RADIAL, 10.7MHz, 110KHz B/WIDTH @ -3dB, 350KHz B/WIDTH @ -20dB, 330	MURATA ELECTRONICS	SFE10.7MHY-A

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number

AE6/2 Spectrum analyzer

When ordering, prefix circuit reference with AE6/2.

	44830-094	Complete unit	Issue 04	
C1 to C3	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C4	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C5	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C6	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C7	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C8 to C12	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C13	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C. VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C14	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C15	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C16	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C17	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C18	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C. VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C19	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C20	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C21	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C22	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C23	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C24	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C25	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C. VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C26	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C27	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C28	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C29	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6/2 Spectrum analyzer (contd.)				
C30 to C33	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C34	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C35	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C36	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C37	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C38	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C39 to C41	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C42	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C43	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C44	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C45 to C47	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C48	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C49	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C50	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C51	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C52	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C53	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C54	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C55	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C56	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C57	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C58	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C59 to C64	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C65	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C66	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C67	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6/2	**Spectrum analyzer (contd.)**			
C68	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C69	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C70	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C71	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C72 to C74	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C75	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C76 to C82	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C83	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C84	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C86	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C87	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C88 to C94	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C103	26386/815	CAPACITOR-FIXED CERAMIC 18pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-180-JP
C104	26386/932	CAPACITOR-FIXED CERAMIC 1nF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	AVX LTD	1206-5A-102-FAT-1A
C105	26386/932	CAPACITOR-FIXED CERAMIC 1nF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	AVX LTD	1206-5A-102-FAT-1A
C106	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C107	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C108	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C109	26451/009	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-470P
C110 to C120	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C136	26386/871	CAPACITOR-FIXED CERAMIC 4.7nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-472-KP
C137	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C138	26451/009	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-470P
C139	26451/009	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-470P
C142	26878/402	CAPACITOR-VARIABLE PTFE 2pF to 15pF 200 ppm/DEG.C, VERTICAL-PCB MOUNT, 5mm DIA, 5mm PWP, 2 PIN, CODED	DAU COMPONENTS LTD	105-3901-015
C151 to C180	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6/2 Spectrum analyzer (contd.)				
C181 to C183	26451/009	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-470P
C184	26386/777	CAPACITOR-FIXED CERAMIC 47nF +/-20% 63V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	PHILIPS	1206-2R-473-K9-BBC
C185 to C191	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C500	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
D1 to D7	28383/931	DIODE PIN, BAR14-1... DUAL, 140mW 100V 100mA 0.5pF 1.25Vf @ 100mA, IN SERIES, MARKING CODE L7,	SIEMENS LTD	BAR14-1-E6327
D9 to D18	28381/531	DIODE VARIABLE CAPACITNCE, BBY31... 28V 20mA 2pF @ 28V, CAPAC RATIO 9.7 TYP, MARKING CODE S1, SURFACE	PHILIPS	BBY31
D19 to D22	28335/670	DIODE BAND SWITCHING, BAT18... 35V 100mA 1pF MAX @ 20V, 1.2Vf @ 100mA, MARKING CODE A2, SURFACE	PHILIPS	BAT18/T1
D23 to D27	28383/931	DIODE PIN, BAR14-1... DUAL, 140mW 100V 100mA 0.5pF 1.25Vf @ 100mA, IN SERIES, MARKING CODE L7,	SIEMENS LTD	BAR14-1-E6327
D28 to D40	28335/670	DIODE BAND SWITCHING, BAT18... 35V 100mA 1pF MAX @ 20V, 1.2Vf @ 100mA, MARKING CODE A2, SURFACE	PHILIPS	BAT18/T1
D41 to D43	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D44	28371/412	DIODE ZENER, BZX84-C5V1... 350mW 5.1V 5% 250mA MARKING CODE Z2, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V1
IC1	28461/522	IC-ANALOGUE LIMITING-AMPLIFIER AD606... 5V 20mA 9-STAGE, LOG AMP FREQ 50MHz MAX, LIMITER OUTPUT	ANALOG DEVICES LTD	AD606JR
IC2	28461/412	IC-ANALOGUE OPERATIONAL AMP TL072... DUAL, 18V UNITY GAIN BNDWDTH 3MHz, OFFSET VOLTAGE 10mV, SLEW	MOTOROLA INC.	TL072CD
IC3	28461/803	IC-ANALOGUE VOLTAGE-REFERENCE LT1019... 5V PRECISION, OUTPUT VOLTAGE DRIFT 20ppm/DEG.C MAX,	LINEAR TECHNOLOGY	LT1019CS8-5
IC4	28461/896	IC-ANALOGUE SWITCH DG413... QUAD, 15V SPST, ON-RESISTANCE<35R, 2 x N/O & 2 x N/C @ LOGIC 1,	TEMIC UK LTD	DG413DY
IC13 to IC15	28461/413	IC-ANALOGUE OPERATIONAL AMP TL074... QUAD, JFET INPUT, LOW NOISE, SLEW RATE 8V/uS MIN, GAIN	MOTOROLA INC.	TL074CD
IC16	28461/885	IC-ANALOGUE D/A-CONVERTER TDA8444... 18V 10mA I.IC BUS CONTROL OF 8x6 BIT CONVERTERS, CMOS, 16 PIN,	PHILIPS	TDA8444-N2
IC17	28467/111	IC-MICRO PERIPHERAL, PCF8574... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 8 DEVICE ADDRESS	PHILIPS	PCF8574T
L1	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L2	23642/555	INDUCTOR-FIXED 10uH +/- 10% COATED-LACQUER, MINIATURE, 470mA 0R9 MAX, 45 Q @ 7.9 MHz, 45 MHz	MEGGITT ELECTRONICS	C11-406/8/27520/006
L3	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L4	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6/2 Spectrum analyzer (contd.)				
L5	23642/555	INDUCTOR-FIXED 10uH +/- 10% COATED-LACQUER, MINIATURE, 470mA 0R9 MAX, 45 Q @ 7.9 MHz, 45 MHz	MEGGITT ELECTRONICS	C11-406/8/27520/006
L6	23642/555	INDUCTOR-FIXED 10uH +/- 10% COATED-LACQUER, MINIATURE, 470mA 0R9 MAX, 45 Q @ 7.9 MHz, 45 MHz	MEGGITT ELECTRONICS	C11-406/8/27520/006
L7	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L8	23642/555	INDUCTOR-FIXED 10uH +/- 10% COATED-LACQUER, MINIATURE, 470mA 0R9 MAX, 45 Q @ 7.9 MHz, 45 MHz	MEGGITT ELECTRONICS	C11-406/8/27520/006
L9	23642/555	INDUCTOR-FIXED 10uH +/- 10% COATED-LACQUER, MINIATURE, 470mA 0R9 MAX, 45 Q @ 7.9 MHz, 45 MHz	MEGGITT ELECTRONICS	C11-406/8/27520/006
L10	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L11 to L24	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L25	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L27	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L28 to L39	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L41	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
R1	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R2	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R3	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R4	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R5	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R6	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R7	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R8	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R9	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R10	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R11	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R12	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R13	24811/168	RESISTOR-FIXED METAL-FILM 619R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-619R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6/2 Spectrum analyzer (contd.)				
R14	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R15	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R16	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R17	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R18	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R19	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R20	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R21	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R22	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R23	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R24	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R25	24811/168	RESISTOR-FIXED METAL-FILM 619R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-619R-1%50ppm
R26	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R27	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R28	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R29	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R30	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R31	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R32	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R33	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R34	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R35	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R36	24811/168	RESISTOR-FIXED METAL-FILM 619R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-619R-1%50ppm
R37	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R38	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R39	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6/2 Spectrum analyzer (contd.)				
R40	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R41	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R42	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R43	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R44	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R45	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R46	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R47	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R48	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R49	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R50	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R51	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R52	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R53	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R54	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R55	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R56	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R57	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R58	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R59	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R61	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R64	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R66	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R67	24811/146	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75R0-1%50ppm
R68	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R73	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6/2 Spectrum analyzer (contd.)				
R74	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R75	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R77	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R78	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R79 to R83	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R84 to R88	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R89	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R90	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R92 to R96	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R97	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R98	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R100	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R102	24811/140	RESISTOR-FIXED METAL-FILM 43R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-43R2-1%50ppm
R103 to R105	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R106	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R107	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R108	24811/147	RESISTOR-FIXED METAL-FILM 82R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-82R5-1%50ppm
R109	24811/123	RESISTOR-FIXED METAL-FILM 8R25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8R25-1%50ppm
R110	24811/236	RESISTOR-FIXED METAL-FILM 432K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-432K-1%50ppm
R111	24811/227	RESISTOR-FIXED METAL-FILM 182K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182K-1%50ppm
R112	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R113	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R114	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R115	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R116	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R117	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6/2 Spectrum analyzer (contd.)				
R118	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R119	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R140	25748/570	RESISTOR-VARIABLE CERMET LINEAR, 50K 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/503
R141	25748/570	RESISTOR-VARIABLE CERMET LINEAR, 50K 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/503
R146	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R147	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R151	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R152	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R153	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R154	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R155	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R156	24811/133	RESISTOR-FIXED METAL-FILM 22R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22R1-1%50ppm
R157	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R158	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R159	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R160	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R161	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R162	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R163	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R164	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R165	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R166	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R167	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R168	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R169	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R170	24811/144	RESISTOR-FIXED METAL-FILM 61R9 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-61R9-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6/2 Spectrum analyzer (contd.)				
R171	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R172	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R173	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R174	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R175	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R176	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R177	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R178	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R179	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R180	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R181	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R182	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R183	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R184	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R185	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R186	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R187	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R188 to R195	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R196	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R197	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R198	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R199	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R200	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R202	24811/207	RESISTOR-FIXED METAL-FILM 27K4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27K4-1%50ppm
R203	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R204	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6/2 Spectrum analyzer (contd.)				
R205	24811/232	RESISTOR-FIXED METAL-FILM 301K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301K-1%50ppm
R206	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R207	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R208	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R209	24811/232	RESISTOR-FIXED METAL-FILM 301K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301K-1%50ppm
R210	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R211	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R212	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R213	24811/232	RESISTOR-FIXED METAL-FILM 301K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301K-1%50ppm
R214	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R215	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R216	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R217	24811/232	RESISTOR-FIXED METAL-FILM 301K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301K-1%50ppm
R218	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R219	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R220	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R221	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R222	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R223	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R224	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R225	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R226	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R227	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R228	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R229	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R230	24811/147	RESISTOR-FIXED METAL-FILM 82R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-82R5-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6/2 Spectrum analyzer (contd.)				
R231	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R232	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R233	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R234	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R235	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R236	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R238	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R239	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R240	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R243 to R247	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R248	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R249	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R251	24811/217	RESISTOR-FIXED METAL-FILM 68K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68K1-1%50ppm
R252	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R500	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
TR1 to TR12	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR13	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR17 to TR21	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR22	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR23	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR26	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR27	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR29 to TR39	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR40	28435/241	TRANSISTOR PNP BIPOLAR BCX17... 45V 100MHz 425mW 500mA 100hFE MIN @ 100mA, MARKING CODE T1, SURFACE	PHILIPS	BCX17

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE6/2 Spectrum analyzer (contd.)				
XL1 to XL5	28312/125	CRYSTAL 10.7 MHz +/- 20 ppm, 30pF SERIES RESONANCE, 25mH - 16R ESR MAX, HC-43/U, WIRE	C-MAC CRYSTALS LTD	C5742
XL6	23642/944	FILTER HF, PCB-MOUNT, CERAMIC, RADIAL, 10.7MHz, 280KHz B/WIDTH @ -3dB, 650KHz B/WIDTH @ -20dB, 330	MURATA ELECTRONICS	SFE10.7MA5-A
XL7	23642/945	FILTER HF, PCB-MOUNT, CERAMIC, RADIAL, 10.7MHz, 110KHz B/WIDTH @ -3dB, 350KHz B/WIDTH @ -20dB, 330	MURATA ELECTRONICS	SFE10.7MHY-A

AE7 Demodulation filter block

When ordering, prefix circuit reference with AE7.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829-847	Complete unit	Issue 20	
C1	26421/142	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1CU-221B
C2	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C3	26421/141	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1VU-101B
C4	26421/141	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1VU-101B
C5	26421/142	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1CU-221B
C6	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C7	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C8	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C9	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C10 to C13	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C14	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C15	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C16 to C24	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C25	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C26	26386/804	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-2R2-DP
C27 to C47	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C48	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C49	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C50	26386/833	CAPACITOR-FIXED CERAMIC 560pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-561-JP
C51	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C52	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C53	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C54	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C55	26386/828	CAPACITOR-FIXED CERAMIC 220pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-221-JP

AE7 Demodulation filter block (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
C56	26343/788	CAPACITOR-FIXED CERAMIC 680pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-681-JP
C60	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C61	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C62	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C63	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C64	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C65	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C66	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C67	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C68	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C69	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C70 to C73	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C74	26386/826	CAPACITOR-FIXED CERAMIC 150pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-151-JP
C75	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C76	26386/826	CAPACITOR-FIXED CERAMIC 150pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-151-JP
C77	26343/788	CAPACITOR-FIXED CERAMIC 680pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-681-JP
C78	26386/867	CAPACITOR-FIXED CERAMIC 2.2nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-222-KP
C79	26386/871	CAPACITOR-FIXED CERAMIC 4.7nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-472-KP
C80	26386/871	CAPACITOR-FIXED CERAMIC 4.7nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-472-KP
C82	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C84	26386/992	CAPACITOR-FIXED CERAMIC 330nF +/-10% 50V X7R, MULTILAYER, SURFACE-MOUNTED, SIZE 1812, NICKEL	PHILIPS	1812-2B-334-K9BB
C85	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C86	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C87	26386/992	CAPACITOR-FIXED CERAMIC 330nF +/-10% 50V X7R, MULTILAYER, SURFACE-MOUNTED, SIZE 1812, NICKEL	PHILIPS	1812-2B-334-K9BB
C88 to C91	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C92	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE7	**Demodulation filter block (contd.)**			
C93	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C94	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C95	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C96	26386/992	CAPACITOR-FIXED CERAMIC 330nF +/-10% 50V X7R, MULTILAYER, SURFACE-MOUNTED, SIZE 1812, NICKEL	PHILIPS	1812-2B-334-K9BB
C97 to C100	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C101	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C102	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C104	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C105	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C106	26386/828	CAPACITOR-FIXED CERAMIC 220pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-221-JP
C107 to C110	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C111 to C132	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C133 to C137	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C138	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C140	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C141	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C145	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C146	26386/833	CAPACITOR-FIXED CERAMIC 560pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-561-JP
C150	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C152	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C153 to C156	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C157 to C159	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C160	26386/828	CAPACITOR-FIXED CERAMIC 220pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-221-JP
C161 to C165	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C166	26386/820	CAPACITOR-FIXED CERAMIC 47pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-470-JP
C167	26386/820	CAPACITOR-FIXED CERAMIC 47pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-470-JP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE7	**Demodulation filter block (contd.)**			
C168	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C169 to C171	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C172	26386/865	CAPACITOR-FIXED CERAMIC 1.5nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-152-KP
D1	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D2 to D11	28383/932	DIODE PIN, HSMP-3810... 250mW 100V 1A 0.35pF Rs 4R0 MAX @ 100mA, MARKING CODE E0, LOW PROFILE,	HEWLETT-PACKARD	HSMP-3810-L31
D12	28371/303	DIODE ZENER, BZX84-C6V2... 350mW 6.2V 5% 250mA MARKING CODE Z4, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C6V2
D13	28371/303	DIODE ZENER, BZX84-C6V2... 350mW 6.2V 5% 250mA MARKING CODE Z4, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C6V2
D14	28371/302	DIODE ZENER, BZX84-C4V7... 350mW 4.7V 5% 250mA MARKING CODE Z1, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C4V7
D15	28371/303	DIODE ZENER, BZX84-C6V2... 350mW 6.2V 5% 250mA MARKING CODE Z4, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C6V2
D16 to D21	28349/029	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2810... 20V 1.2pF 410mVf @ 1mA, MARKNG CODE B0, LOW PROFILE,	HEWLETT-PACKARD	HSMS-2810-L31
D22	28371/494	DIODE VOLTAGE REFERENCE, 1N825... 250mW 6.2V 5% 50mA 20ppm/DEG.C, AXIAL, DO-7, (TAPED).	PHILIPS	1N825
D23	28371/494	DIODE VOLTAGE REFERENCE, 1N825... 250mW 6.2V 5% 50mA 20ppm/DEG.C, AXIAL, DO-7, (TAPED).	PHILIPS	1N825
D25	28371/443	DIODE ZENER, BZX84-C5V6... 350mW 5.6V 5% 250mA MARKING CODE Z3, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V6
D26 to D28	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D29	28371/443	DIODE ZENER, BZX84-C5V6... 350mW 5.6V 5% 250mA MARKING CODE Z3, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V6
D30	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D31	28349/029	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2810... 20V 1.2pF 410mVf @ 1mA, MARKNG CODE B0, LOW PROFILE,	HEWLETT-PACKARD	HSMS-2810-L31
D32	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D33	28371/494	DIODE VOLTAGE REFERENCE, 1N825... 250mW 6.2V 5% 50mA 20ppm/DEG.C, AXIAL, DO-7, (TAPED).	PHILIPS	1N825
IC1	28467/111	IC-MICRO PERIPHERAL, PCF8574... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 8 DEVICE ADDRESS	PHILIPS	PCF8574T
IC2	28461/891	IC-ANALOGUE SWITCH DG540... QUAD, 20mA RF VIDEO T-SWITCH, BANDWIDTH 500MHz, ISOLATION 80dB @ 5MHz,	TEMIC UK LTD	DG540DJ
IC3	28461/891	IC-ANALOGUE SWITCH DG540... QUAD, 20mA RF VIDEO T-SWITCH, BANDWIDTH 500MHz, ISOLATION 80dB @ 5MHz,	TEMIC UK LTD	DG540DJ
IC4	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE7	**Demodulation filter block (contd.)**			
IC5	28461/890	IC-ANALOGUE VIDEO DIFF AMPLIFIER 592B... 2 INPUT, SINGLE, 8V INPUT NOISE 3uV, MONOLITHIC, 8 PIN,	TEXAS INSTRUMENTS	TL592BP
IC6	28531/021	RF-MIXER DOUBLE-BALANCED, SL6440C... 150MHz MAX, 15 dBm RF-1dB COMPRESS, +30dBm INTERCEPT,		
IC7	28461/892	IC-ANALOGUE OPERATIONAL AMP MC34082... DUAL, 44V JFET INPUT, SLEW RATE 20V/uS, GAIN BANDWIDTH PROD	MOTOROLA INC.	MC34082P
IC8	28461/893	IC-ANALOGUE LIMITING-AMPLIFIER NE614A... 8V LOW POWER FM IF SYSTEM, MONOLITHIC, 16 PIN,	PHILIPS	NE614AN
IC9	28469/197	IC-DIGITAL RECEIVER 75108... DUAL, LINE, OPEN-COLLECTOR, TTL, 14 PIN, DUAL-IN-LINE.	NAT. SEMICONDUCTOR	DS75108N
IC10	28461/458	IC-ANALOGUE OPERATIONAL AMP OP37... 15V LOW NOISE, HI-SPEED, PRECISION, BIPOLAR, 8 PIN,	ANALOG DEVICES LTD	OP37GS
IC11	28461/924	IC-ANALOGUE MODULATR/DEMODULATOR 1496... 30V BALANCED, SUPPRESSION 50dB @ 10MHz, 3dB SIGNAL	PHILIPS	MC1496N
IC12	28461/413	IC-ANALOGUE OPERATIONAL AMP TL074... QUAD, JFET INPUT, LOW NOISE, SLEW RATE 8V/uS MIN, GAIN	MOTOROLA INC.	TL074CD
IC13	28461/459	IC-ANALOGUE OPERATIONAL AMP TL032... DUAL, 15V U/GAIN BANDWDTH 1.1MHz, OFFSET VOLTAGE 2.0mV, SLEW	TEXAS INSTRUMENTS	TL032CD(TUBE)
IC14	28461/413	IC-ANALOGUE OPERATIONAL AMP TL074... QUAD, JFET INPUT, LOW NOISE, SLEW RATE 8V/uS MIN, GAIN	MOTOROLA INC.	TL074CD
IC15	28461/896	IC-ANALOGUE SWITCH DG413... QUAD, 15V SPST, ON-RESISTANCE<35R, 2 x N/O & 2 x N/C @ LOGIC 1,	TEMIC UK LTD	DG413DY
IC16	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC17	28461/741	IC-ANALOGUE VOLTAGE-REGULATOR LM317L... 37V 100mA POSITIVE ADJUSTABLE, LINEAR, MONOLITHIC, 3 PIN,	NAT. SEMICONDUCTOR	LM317LZ
IC18	28461/896	IC-ANALOGUE SWITCH DG413... QUAD, 15V SPST, ON-RESISTANCE<35R, 2 x N/O & 2 x N/C @ LOGIC 1,	TEMIC UK LTD	DG413DY
IC19	28461/458	IC-ANALOGUE OPERATIONAL AMP OP37... 15V LOW NOISE, HI-SPEED, PRECISION, BIPOLAR, 8 PIN,	ANALOG DEVICES LTD	OP37GS
L1	23642/701	INDUCTOR-FIXED 2.2uH +/- 5% EPOXY-MOULD, 320mA 1R MAX, 30 Q @ 7.96 MHz, 75 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-2R2-J
L2	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L3	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L4	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L5	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L6	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L7	23642/527	INDUCTOR-FIXED 33uH +/- 5% EPOXY-MOULD, 70mA 5R6 MAX, 30 Q @ 2.52 MHz, 17 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-330-J
L8	23642/529	INDUCTOR-FIXED 68uH +/- 5% EPOXY-MOULD, 50mA 9R MAX, 30 Q @ 2.52 MHz, 11 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-680-J
L9	23642/527	INDUCTOR-FIXED 33uH +/- 5% EPOXY-MOULD, 70mA 5R6 MAX, 30 Q @ 2.52 MHz, 17 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-330-J

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE7	**Demodulation filter block (contd.)**			
L10	23642/529	INDUCTOR-FIXED 68uH +/- 5% EPOXY-MOULD, 50mA 9R MAX, 30 Q @ 2.52 MHz, 11 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-680-J
L11	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L12	23642/538	INDUCTOR-FIXED 0.47uH +/- 20% EPOXY-MOULD, 450mA 0R5 MAX, 30 Q @ 25.2 MHz, 220 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R47-M
L13	23642/528	INDUCTOR-FIXED 47uH +/- 5% EPOXY-MOULD, 60mA 7R MAX, 30 Q @ 2.52 MHz, 15 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-470-J
L14	23642/528	INDUCTOR-FIXED 47uH +/- 5% EPOXY-MOULD, 60mA 7R MAX, 30 Q @ 2.52 MHz, 15 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-470-J
L16	23642/526	INDUCTOR-FIXED 470uH +/- 10% EPOXY-MOULD, 62mA 26R MAX, 40 Q @ 0.796 MHz, 3 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3613-T-471-K
L17	23642/537	INDUCTOR-FIXED 4.7uH +/- 5% EPOXY-MOULD, 220mA 1R5 MAX, 30 Q @ 7.96 MHz, 50 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-4R7-J
L18	23642/524	INDUCTOR-FIXED 1mH +/- 10% EPOXY-MOULD, 30mA 40R MAX, 30 Q @ 0.252 MHz, 2.5 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3613-T-102-K
L19	23642/524	INDUCTOR-FIXED 1mH +/- 10% EPOXY-MOULD, 30mA 40R MAX, 30 Q @ 0.252 MHz, 2.5 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3613-T-102-K
L20	23642/526	INDUCTOR-FIXED 470uH +/- 10% EPOXY-MOULD, 62mA 26R MAX, 40 Q @ 0.796 MHz, 3 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3613-T-471-K
L21	23642/524	INDUCTOR-FIXED 1mH +/- 10% EPOXY-MOULD, 30mA 40R MAX, 30 Q @ 0.252 MHz, 2.5 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3613-T-102-K
L22	23642/525	INDUCTOR-FIXED 680uH +/- 10% EPOXY-MOULD, 50mA 30R MAX, 30 Q @ 0.796 MHz, 3 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3613-T-681-K
L23	23642/528	INDUCTOR-FIXED 47uH +/- 5% EPOXY-MOULD, 60mA 7R MAX, 30 Q @ 2.52 MHz, 15 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-470-J
L24	23642/528	INDUCTOR-FIXED 47uH +/- 5% EPOXY-MOULD, 60mA 7R MAX, 30 Q @ 2.52 MHz, 15 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-470-J
L25	23642/525	INDUCTOR-FIXED 680uH +/- 10% EPOXY-MOULD, 50mA 30R MAX, 30 Q @ 0.796 MHz, 3 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3613-T-681-K
R1 to R3	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R4	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R6	24811/217	RESISTOR-FIXED METAL-FILM 68K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68K1-1%50ppm
R7	24811/209	RESISTOR-FIXED METAL-FILM 33K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-1%50ppm
R8	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R9	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R10	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R11	24811/179	RESISTOR-FIXED METAL-FILM 1K82 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K82-1%50ppm
R13	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE7	**Demodulation filter block (contd.)**			
R14	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R15	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R16	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R17	24811/217	RESISTOR-FIXED METAL-FILM 68K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68K1-1%50ppm
R18	24811/209	RESISTOR-FIXED METAL-FILM 33K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-1%50ppm
R19	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R20	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R21	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R22	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R23	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R24	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R25	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R26	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R27	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R28	24811/217	RESISTOR-FIXED METAL-FILM 68K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68K1-1%50ppm
R29	24811/209	RESISTOR-FIXED METAL-FILM 33K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-1%50ppm
R30	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R31	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R32	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R33	24811/217	RESISTOR-FIXED METAL-FILM 68K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68K1-1%50ppm
R34	24811/209	RESISTOR-FIXED METAL-FILM 33K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-1%50ppm
R35	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R36	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R37	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R38	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R39	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE7	**Demodulation filter block (contd.)**			
R40	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R41	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R42	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R43	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R44	24811/160	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301R-1%50ppm
R45	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R46	24811/160	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301R-1%50ppm
R47	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R48	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R49	24811/160	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301R-1%50ppm
R50	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R51	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R52	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R53	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R54	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R55	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R56	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R57 to R59	24811/160	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301R-1%50ppm
R60	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R61	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R62	24811/148	RESISTOR-FIXED METAL-FILM 90R9 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-90R9-1%50ppm
R63	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R64	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R65	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R66	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R68	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE7	**Demodulation filter block (contd.)**			
R69	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R70	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R71	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R72	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R73	24811/188	RESISTOR-FIXED METAL-FILM 4K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K32-1%50ppm
R74	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R75	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R76	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R77	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R78	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R79	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R80	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R81	24811/224	RESISTOR-FIXED METAL-FILM 130K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-130K-1%50ppm
R82	24811/208	RESISTOR-FIXED METAL-FILM 30K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-30K1-1%50ppm
R83	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R84	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R85	24811/166	RESISTOR-FIXED METAL-FILM 511R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-511R-1%50ppm
R86	24811/223	RESISTOR-FIXED METAL-FILM 121K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-121K-1%50ppm
R87	24811/195	RESISTOR-FIXED METAL-FILM 8K25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K25-1%50ppm
R88	24811/147	RESISTOR-FIXED METAL-FILM 82R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-82R5-1%50ppm
R89	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R90	25748/569	RESISTOR-VARIABLE CERMET LINEAR, 1K 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB, 0.375in	MEGGITT ELECTRONICS	4290W404/8/06411/102
R91	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R92	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R93	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R94	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm

AE7 Demodulation filter block (contd.)

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
R95	24811/158	RESISTOR-FIXED METAL-FILM 243R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-243R-1%50ppm
R96	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R97	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R99	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R100	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R101	24811/162	RESISTOR-FIXED METAL-FILM 365R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-365R-1%50ppm
R102	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R103	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R104	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R105	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R106	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R107	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R108	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R109	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R110	24811/219	RESISTOR-FIXED METAL-FILM 82K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-82K5-1%50ppm
R111	24811/219	RESISTOR-FIXED METAL-FILM 82K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-82K5-1%50ppm
R112	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R113	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R114	24811/163	RESISTOR-FIXED METAL-FILM 392R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-392R-1%50ppm
R115	24811/172	RESISTOR-FIXED METAL-FILM 909R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-909R-1%50ppm
R116	25748/564	RESISTOR-VARIABLE CERMET LINEAR, 500R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/501
R117	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R118	24811/184	RESISTOR-FIXED METAL-FILM 3K01 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K01-1%50ppm
R119	24811/199	RESISTOR-FIXED METAL-FILM 12K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-12K1-1%50ppm
R120	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R121 to R124	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE7	**Demodulation filter block (contd.)**			
R125	24811/226	RESISTOR-FIXED METAL-FILM 162K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VTM (UK) LTD	501-0-162K-1%-50ppm
R126	24811/226	RESISTOR-FIXED METAL-FILM 162K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VTM (UK) LTD	501-0-162K-1%-50ppm
R127	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R128	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R129	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R130	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R131	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R132	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R133	24811/209	RESISTOR-FIXED METAL-FILM 33K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-1%50ppm
R134	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R135	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R136	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R137	24811/244	RESISTOR-FIXED METAL-FILM 909K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-909K-1%50ppm
R138	24811/215	RESISTOR-FIXED METAL-FILM 56K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56K2-1%50ppm
R139	25748/570	RESISTOR-VARIABLE CERMET LINEAR, 50K 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/503
R140	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R141	24811/241	RESISTOR-FIXED METAL-FILM 681K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681K-1%50ppm
R142	24811/241	RESISTOR-FIXED METAL-FILM 681K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681K-1%50ppm
R143	24811/172	RESISTOR-FIXED METAL-FILM 909R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-909R-1%50ppm
R145	25748/567	RESISTOR-VARIABLE CERMET LINEAR, 200R 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/201
R146	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R147	24811/188	RESISTOR-FIXED METAL-FILM 4K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K32-1%50ppm
R148	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R149	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R150	24811/163	RESISTOR-FIXED METAL-FILM 392R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-392R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE7	**Demodulation filter block (contd.)**			
R151	24811/200	RESISTOR-FIXED METAL-FILM 13K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-13K-1%50ppm
R152	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R153	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R154	25748/569	RESISTOR-VARIABLE CERMET LINEAR, 1K 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB, 0.375in	MEGGITT ELECTRONICS	4290W404/8/06411/102
R155	24811/198	RESISTOR-FIXED METAL-FILM 11K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-11K-1%50ppm
R156	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R157	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R158	24811/215	RESISTOR-FIXED METAL-FILM 56K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56K2-1%50ppm
R159	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R160	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R161	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R162	24811/178	RESISTOR-FIXED METAL-FILM 1K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-1%50ppm
R165	24811/200	RESISTOR-FIXED METAL-FILM 13K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-13K-1%50ppm
R166	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R167	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R168	24811/168	RESISTOR-FIXED METAL-FILM 619R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-619R-1%50ppm
TR2 to TR8	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR9 to TR12	28457/852	TRANSISTOR PNP BIPOLAR BSR15... 40V 200MHz 300mW 600mA MARKING CODE CH/T7p, SURFACE MOUNTED,	PHILIPS	BSR15
TR14	28459/061	TRANSISTOR N-CHANNEL-DEPLETION JFET BSR56... 40V 250mW 50mA MARKING CODE M4, SURFACE MOUNTED,	PHILIPS	BSR56
TR17	28455/302	TRANSISTOR NPN BIPOLAR BCX54... 45V 130MHz 1W 1A 40hFE MIN @ 150mA, MARKING CODE BA, SURFACE	PHILIPS	BCX54
X1	28312/127	FILTER CRYSTAL, PCB-MOUNT, 10.7MHz, MONOLITHIC, 6dB PASSBND +/-7.5KHz, 65dB STOPBND 17KHz, 8	IQD LTD	10M15D
X2	28312/128	FILTER CRYSTAL, PCB-MOUNT, 10.7MHz, MONOLITHIC, 6dB PASSBND +/-3.75KHz, 65dB STOPBND 8.7KHz, 8	IQD LTD	10M08D
X3	28312/126	FILTER CRYSTAL, PCB-MOUNT, 10.7MHz, MONOLITHIC, SSB, 6dB PASSBND +/-1.1KHz, 20dB STOPBND 1.5KHz, 8	IQD LTD	10M22D

AE8 SSB BFO

When ordering, prefix circuit reference with AE8.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829/997	Complete unit	Issue 01	
C1	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C2	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C3	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C4	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C5	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C6	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C7	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C8	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C9	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C10	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C12	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C13	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C14	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C15	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C16	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C17	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C22	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C23	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C24	26451/003	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 4.3 x 4.3mm,	PANASONIC INDUSTRIAL	ECE-V-1CA-100R
C25	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C26	26386/869	CAPACITOR-FIXED CERAMIC 3.3nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-332-KP
C27	26386/827	CAPACITOR-FIXED CERAMIC 180pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-181-JP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE8	**SSB BFO (contd.)**			
C28	26386/877	CAPACITOR-FIXED CERAMIC 15nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-153-KP
C30	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C31 to C33	26386/934	CAPACITOR-FIXED CERAMIC 220pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-221-FAT-00J
C34	26386/931	CAPACITOR-FIXED CERAMIC 470pF +/-1% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	AVX LTD	0805-5A-471-FAT-00-J
C35	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C36	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C37	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C38	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C39	26451/010	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 6.6 x 6.6mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-101P
C40	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C41	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C42	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C43	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
D2	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D3	28381/342	DIODE VARIABLE CAPACITNCE, KV1226... DUAL, 30V 565pF @ 1V, 21PF @ 25V, CAPAC RATIO 20 MIN,	TOKO (UK) LTD	KV1226
IC1	28469/543	IC-DIGITAL COUNTER 74HC390... 4 BIT, DUAL, DECADE RIPPLE, CMOS-H/SPEED, 16 PIN, SMALL-OUTLINE.	PHILIPS	74HC390D
IC2	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC3	28466/390	IC-DIGITAL NAND-GATE 74HC00... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC00D
IC4	28461/437	IC-ANALOGUE OPERATIONAL AMP 5534... 2 INPUT, SINGLE, 10V 16mA LOW NOISE, 10MHz, BIPOLAR, 8 PIN,	PHILIPS	NE5534D
IC5	28461/437	IC-ANALOGUE OPERATIONAL AMP 5534... 2 INPUT, SINGLE, 10V 16mA LOW NOISE, 10MHz, BIPOLAR, 8 PIN,	PHILIPS	NE5534D
IC7	28464/184	IC-DIGITAL COUNTER 74HC161... 4 INPUT, 4 BIT, SINGLE, BINARY, PRESETTABLE, SYNCHRONOUS,	PHILIPS	74HC161D
IC8	28464/189	IC-DIGITAL COUNTER 74HC393... 4 BIT, DUAL, BINARY RIPPLE, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC393D

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE8 SSB BFO (contd.)				
L1	23642/512	INDUCTOR-FIXED 22uH +/- 5% MOULDED-EPOXY, 110mA 3R7 MAX, 30 Q @ 2.5 MHz, 25 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-220-J
PLA	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
PLJ	23435/120	CONNECTOR MULTIWAY, PCB HEADER, 36 WAY, RIGHT ANGLED, 2.54mm PITCH, PINS GOLD PLATED TO CLASS 2,	BERG ELECTRONICS	75168-101-36
R1 to R3	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R4	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R6	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R7	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R9	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R10 to R12	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R13 to R15	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R20	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R21	24811/145	RESISTOR-FIXED METAL-FILM 68R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68R1-1%50ppm
R22	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R23	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R24	24811/162	RESISTOR-FIXED METAL-FILM 365R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-365R-1%50ppm
R25 to R28	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R29	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R30	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R41	24811/133	RESISTOR-FIXED METAL-FILM 22R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22R1-1%50ppm
R42	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R43	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R44	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R45	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AE8	**SSB BFO (contd.)**			
R46	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R47	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R48	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R50	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R51	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R52	24811/209	RESISTOR-FIXED METAL-FILM 33K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33K2-1%50ppm
SKG to SKN	23436/754	CONNECTOR MULTIWAY, SOCKET, 3 WAY, STRAIGHT, 2.54mm PITCH, PCB MOUNTING, CONTACTS GOLD PLATED	BERG ELECTRONICS	76308-103
TR1	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR2	28433/828	TRANSISTOR PNP BIPOLAR BC858B... 30V 150MHz 200mW 100mA 220hFE MIN @ 2mA, MARKING CODE 3K, SURFACE	PHILIPS	BC858B
TR3	28433/828	TRANSISTOR PNP BIPOLAR BC858B... 30V 150MHz 200mW 100mA 220hFE MIN @ 2mA, MARKING CODE 3K, SURFACE	PHILIPS	BC858B

Clr. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number

AA1/1 Input switch

When ordering, prefix circuit reference with AA1/1.

	44830/040	Complete unit	Issue 04	
C1	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C2	26451/008	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-470P
C3	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C4	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C5	26451/008	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 6.3V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	PANASONIC INDUSTRIAL	ECE-V-0JA-470P
C6	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C7 to C9	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C10	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C11	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C12	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C13 to C24	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C28 to C44	26386/828	CAPACITOR-FIXED CERAMIC 220pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-221-JP
C45	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C46	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C47	26386/828	CAPACITOR-FIXED CERAMIC 220pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-221-JP
C50	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C51 to C68	26386/828	CAPACITOR-FIXED CERAMIC 220pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-221-JP
C69	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C70	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C71	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C72 to C77	26386/800	CAPACITOR-FIXED CERAMIC 1pF +/-0.5pF 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-1R0-DP
D1	28349/029	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2810... 20V 1.2pF 410mVf @ 1mA, MARKNG CODE B0, LOW PROFILE,	HEWLETT-PACKARD	HSMS-2810-L31

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AA1/1 Input switch (contd.)				
D2	28349/029	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2810... 20V 1.2pF 410mVf @ 1mA, MARKNG CODE B0, LOW PROFILE,	HEWLETT-PACKARD	HSMS-2810-L31
D3	28349/032	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2820... 8V 1pF 340mVf @ 1mA, MARKNG CODE C0, LOW PROFILE, SURFACE	HEWLETT-PACKARD	HSMS-2820-L31
D4	28349/032	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2820... 8V 1pF 340mVf @ 1mA, MARKNG CODE C0, LOW PROFILE, SURFACE	HEWLETT-PACKARD	HSMS-2820-L31
D5 to D7	28371/302	DIODE ZENER, BZX84-C4V7... 350mW 4.7V 5% 250mA MARKING CODE Z1, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C4V7
D8 to D23	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D24	28371/301	DIODE ZENER, BZX84-C4V3... 350mW 4.3V 5% 250mA MARKING CODE Z17/W9, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C4V3
D25	28383/941	DIODE BAND SWITCHING, BA682... 35V 100mA 1.2pF MAX @ 3V, SURFACE MOUNTED, SOD-80, (8mm TAPE -	PHILIPS	BA682
D26	28383/941	DIODE BAND SWITCHING, BA682... 35V 100mA 1.2pF MAX @ 3V, SURFACE MOUNTED, SOD-80, (8mm TAPE -	PHILIPS	BA682
D27	28371/301	DIODE ZENER, BZX84-C4V3... 350mW 4.3V 5% 250mA MARKING CODE Z17/W9, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C4V3
IC1	28467/110	IC-MICRO PERIPHERAL, PCF8574A... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 16 DEVICE ADDRESS	PHILIPS	PCF8574AT
IC2	28467/110	IC-MICRO PERIPHERAL, PCF8574A... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 16 DEVICE ADDRESS	PHILIPS	PCF8574AT
IC3	28461/412	IC-ANALOGUE OPERATIONAL AMP TL072... DUAL, 18V UNITY GAIN BNDWDTH 3MHz, OFFSET VOLTAGE 10mV, SLEW	MOTOROLA INC.	TL072CD
IC4	28466/390	IC-DIGITAL NAND-GATE 74HC00... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC00D
IC5	28466/390	IC-DIGITAL NAND-GATE 74HC00... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC00D
IC6	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC7 to IC9	28466/390	IC-DIGITAL NAND-GATE 74HC00... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC00D
IC10	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC11	28461/412	IC-ANALOGUE OPERATIONAL AMP TL072... DUAL, 18V UNITY GAIN BNDWDTH 3MHz, OFFSET VOLTAGE 10mV, SLEW	MOTOROLA INC.	TL072CD
IC12	28471/060	IC-MICRO EEPROM, 512 x 8 BIT, 24C04... 5V SUPPLY, 2-WIRE SERIAL INTERFACE, COMMON I/O, OPEN-DRAIN	ATMEL CORPORATION	AT24C04N-10SC-2.7
IC13	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
L1 to L3	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L4	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AA1/1 Input switch (contd.)				
PLA	23436/900	CONNECTOR MULTIWAY, PCB HEADER, 10 WAY, RIGHT ANGLED, 2-ROW, 2.54mm GRID, POLARISED, SHROUDED,	MOLEX ELECTRONICS	39-26-7108
R1	24811/203	RESISTOR-FIXED METAL-FILM 18K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-18K2-1%50ppm
R2	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R3	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R4	24811/253	RESISTOR-FIXED METAL-FILM 2M21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2M21-1%50ppm
R5	24811/191	RESISTOR-FIXED METAL-FILM 5K62 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-5K62-1%50ppm
R6 to R11	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R12 to R21	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R22 to R27	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R28 to R31	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R32 to R35	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R36 to R39	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R40	24811/204	RESISTOR-FIXED METAL-FILM 20K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20K-1%50ppm
R41	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R42	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R43	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R44	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R45	24811/215	RESISTOR-FIXED METAL-FILM 56K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56K2-1%50ppm
R46	24811/215	RESISTOR-FIXED METAL-FILM 56K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56K2-1%50ppm
R47	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R48	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R49	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R50	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R51 to R53	24811/904	RESISTOR-FIXED METAL-FILM 24R3 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-24R3-1%

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AA1/1 Input switch (contd.)				
R54	24811/909	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-51R1-1%
R55	24811/909	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-51R1-1%
R56	24811/911	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-75R0-1%
R57	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R58	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R60	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R61	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R66	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R67	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R69	24811/204	RESISTOR-FIXED METAL-FILM 20K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20K-1%50ppm
R70	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R71 to R73	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
RLA to RLE	23486/181	RELAY MAGNETIC, SINGLE-POLE CHANGEOVER, POLARISED DUAL 5V COIL, 62R - LATCHING, ISOL 60dB @ 1.8GHz,	MATSUSHITA CONTROLS	RK1-L2-5V-H23
RLF	23486/182	RELAY MAGNETIC, SINGLE-POLE CHANGEOVER, POLARISED SINGLE 5V COIL, 125R - ISOL 60dB @ 1.8GHz, MI	MATSUSHITA CONTROLS	RK1-5V-H22
RLG	23486/181	RELAY MAGNETIC, SINGLE-POLE CHANGEOVER, POLARISED DUAL 5V COIL, 62R - LATCHING, ISOL 60dB @ 1.8GHz,	MATSUSHITA CONTROLS	RK1-L2-5V-H23
RLH	23486/182	RELAY MAGNETIC, SINGLE-POLE CHANGEOVER, POLARISED SINGLE 5V COIL, 125R - ISOL 60dB @ 1.8GHz, MI	MATSUSHITA CONTROLS	RK1-5V-H22
RLJ	23486/181	RELAY MAGNETIC, SINGLE-POLE CHANGEOVER, POLARISED DUAL 5V COIL, 62R - LATCHING, ISOL 60dB @ 1.8GHz,	MATSUSHITA CONTROLS	RK1-L2-5V-H23
TR1 to TR16	28435/241	TRANSISTOR PNP BIPOLAR BCX17... 45V 100MHz 425mW 500mA 100hFE MIN @ 100mA, MARKING CODE T1, SURFACE	PHILIPS	BCX17

AB2 Power meter

When ordering, prefix circuit reference with AB2.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829-850	Complete unit	Issue 08	
C1	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C2	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C3	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C4	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C5	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C6	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C7	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C8	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C9	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C10	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C11	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C12	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C13	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C15	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C16	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C17	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C18	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C19	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C20	26386/823	CAPACITOR-FIXED CERAMIC 82pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-820-JP
C21	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C22	26386/823	CAPACITOR-FIXED CERAMIC 82pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-820-JP
C23	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C24	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C25	26582/426	CAPACITOR-FIXED POLYESTER 10nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	DUBILIER CAPACITORS	MMP-10nF-K-63V-T/R

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AB2	**Power meter (contd.)**			
C26	26582/426	CAPACITOR-FIXED POLYESTER 10nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	DUBILIER CAPACITORS	MMP-10nF-K-63V-T/R
C27	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C28	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C29	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C30	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C31	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C32	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C33	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C34	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C35	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C36	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C37	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C38	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C39	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C40	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C41	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C42	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C43	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C44	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C45	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C46	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C47	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C48	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C49	26386/778	CAPACITOR-FIXED CERAMIC 22nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-223-K9-BBC
C50	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C51	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AB2	**Power meter (contd.)**			
C52	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C53	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C54	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C55	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C56	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C57 to C62	26386/881	CAPACITOR-FIXED CERAMIC 33nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-333-KP
IC1	28461/368	IC-ANALOGUE OPERATIONAL AMP OP27... SINGLE, ULTRA LOW NOISE, SLEW-RATE 2.8V/uS TYP, MONOLITHIC, 8	HARRIS SEMICONDUCTOR	HA3-5127-5
IC2	28461/368	IC-ANALOGUE OPERATIONAL AMP OP27... SINGLE, ULTRA LOW NOISE, SLEW-RATE 2.8V/uS TYP, MONOLITHIC, 8	HARRIS SEMICONDUCTOR	HA3-5127-5
IC3	28461/412	IC-ANALOGUE OPERATIONAL AMP TL072... DUAL, 18V UNITY GAIN BNDWDTH 3MHz, OFFSET VOLTAGE 10mV, SLEW	MOTOROLA INC.	TL072CD
IC4	28469/762	IC-ANALOGUE MULTIPLEXER DG409... 8 INPUT, DUAL, 15V 35uA DIFFERENTIAL 4 CHANNEL, RDS<100R, CMOS,	TEMIC UK LTD	DG409DY
IC5	28461/412	IC-ANALOGUE OPERATIONAL AMP TL072... DUAL, 18V UNITY GAIN BNDWDTH 3MHz, OFFSET VOLTAGE 10mV, SLEW	MOTOROLA INC.	TL072CD
IC6	28469/762	IC-ANALOGUE MULTIPLEXER DG409... 8 INPUT, DUAL, 15V 35uA DIFFERENTIAL 4 CHANNEL, RDS<100R, CMOS,	TEMIC UK LTD	DG409DY
IC7	28461/521	IC-ANALOGUE OPERATIONAL AMP LM6144... QUAD, 24V RAIL TO RAIL I/P & O/P, SLEW RATE 11V/uS, GAIN	NAT. SEMICONDUCTOR	LM6144BIM
IC8	28461/888	IC-ANALOGUE SWITCH DG419... SINGLE, 15V SPDT, ON-RESISTANCE<35R, CHANGEOVER, TTL COMPATIBLE,	TEMIC UK LTD	DG419DY
IC9	28468/307	IC-DIGITAL FLIP-FLOP/MONOSTABLE 4047... MONO/ASTABLE MULTIVIBRATOR, tW = 2.48RC, CMOS, 14	PHILIPS	HEF4047BP
IC10	28466/414	IC-DIGITAL EXCLUSIVE-OR 74HC86... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC86D
IC11	28461/676	IC-ANALOGUE COMPARATOR LM311... 2 INPUT, SINGLE, 15V I/P-OFFSET 7.5mV MAX, RESPONSE-TIME 200nS TYP,	PHILIPS	LM311D
L1 to L3	23642/701	INDUCTOR-FIXED 2.2uH +/- 5% EPOXY-MOULD, 320mA 1R MAX, 30 Q @ 7.96 MHz, 75 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-2R2-J
PLA	28488/004	SOCKET SINGLE CONTACT, FOR 0.41-0.48mm DIA LEADS, COPPER BODY, GOLD PLATE OVER COPPER PLATE.	WEARNES HOLLINGSWRTH	450-3772-01-03-00
R1	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R2	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AB2	**Power meter (contd.)**			
R3	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R4	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R5 to R8	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R9	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R11	24811/176	RESISTOR-FIXED METAL-FILM 1K3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K3-1%50ppm
R15	24811/201	RESISTOR-FIXED METAL-FILM 15K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15K-1%50ppm
R16	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R17	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R18	24811/218	RESISTOR-FIXED METAL-FILM 75K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75K-1%50ppm
R19	24811/192	RESISTOR-FIXED METAL-FILM 6K19 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K19-1%50ppm
R20	24811/218	RESISTOR-FIXED METAL-FILM 75K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-75K-1%50ppm
R21	24811/613	RESISTOR-FIXED METAL-FILM 8K06 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K06-0.1%-15
R22	24811/614	RESISTOR-FIXED METAL-FILM 1K62 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-0.1%-15
R23	24811/616	RESISTOR-FIXED METAL-FILM 324R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-324R-0.1%-15
R24	24811/615	RESISTOR-FIXED METAL-FILM 162R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-162R-0.1%-15
R25	24811/616	RESISTOR-FIXED METAL-FILM 324R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-324R-0.1%-15
R26	24811/614	RESISTOR-FIXED METAL-FILM 1K62 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-0.1%-15
R27	24811/613	RESISTOR-FIXED METAL-FILM 8K06 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K06-0.1%-15
R28 to R31	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R32	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R33	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R34	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R35	24811/613	RESISTOR-FIXED METAL-FILM 8K06 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K06-0.1%-15
R36	24811/614	RESISTOR-FIXED METAL-FILM 1K62 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-0.1%-15
R37	24811/616	RESISTOR-FIXED METAL-FILM 324R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-324R-0.1%-15
R38	24811/615	RESISTOR-FIXED METAL-FILM 162R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-162R-0.1%-15

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AB2	**Power meter (contd.)**			
R39	24811/616	RESISTOR-FIXED METAL-FILM 324R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-324R-0.1%-15
R40	24811/614	RESISTOR-FIXED METAL-FILM 1K62 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K62-0.1%-15
R41	24811/613	RESISTOR-FIXED METAL-FILM 8K06 +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K06-0.1%-15
R42 to R45	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R46	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R47	24811/202	RESISTOR-FIXED METAL-FILM 16K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16K2-1%50ppm
R48	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R49 to R52	24811/607	RESISTOR-FIXED METAL-FILM 20K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-20K0-0.1%-15
R53	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R54	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R55	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R56	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R57	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R58	24811/195	RESISTOR-FIXED METAL-FILM 8K25 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-8K25-1%50ppm
R59	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R60	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R61	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R62 to R64	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R65	25683/651	THERMISTOR POSITIVE-TC ROD, 7.62mm 10K @ 25 DEG.C, 0.7 %/DEG.C +/- 10% 125mW @ 100 DEG.C, AXIAL.	AMETEK (USA)	DG125-103K

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number

AB3 Mixer module

When ordering, prefix circuit reference with AB3.

	44830-011	Complete unit	Issue 03	
C1 to C13	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C14 to C25	26386/828	CAPACITOR-FIXED CERAMIC 220pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-221-JP
C26 to C43	26386/899	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1206, NICKEL	ROHM ELECTRONICS LTD	MCH31-5C-104-KP
C44 to C47	26451/006	CAPACITOR-FIXED ALUMINIUM 22uF +/-20% 16V ELECTROLYTIC, SURFACE-MOUNTED, SIZE 5.3 x 5.3mm,	RUBYCON CAPACITORS	16-REV-22
C50 to C53	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
D1 to D17	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
FL1	23642/945	FILTER HF, PCB-MOUNT, CERAMIC, RADIAL, 10.7MHz, 110KHz B/WIDTH @ -3dB, 350KHz B/WIDTH @ -20dB, 330	MURATA ELECTRONICS	SFE10.7MHY-A
IC1	28467/110	IC-MICRO PERIPHERAL, PCF8574A... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 16 DEVICE ADDRESS	PHILIPS	PCF8574AT
IC3 to IC5	28466/390	IC-DIGITAL NAND-GATE 74HC00... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC00D
IC6	28469/057	IC-DIGITAL INVERTER 74HC04... HEX, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC04D
IC7	28531/029	RF-MIXER DOUBLE-BALANCED, DIODE RING, LMX-149... 10-1500MHz, 50R 1 dBm RF-1dB COMPRESS, 9 dB LOSS,	MINI-CIRCUITS	LMX-149
L1	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L2	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L4	23642/529	INDUCTOR-FIXED 68uH +/- 5% EPOXY-MOULD, 50mA 9R MAX, 30 Q @ 2.52 MHz, 11 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-680-J
PLA	23437/008	CONNECTOR MULTIWAY, PCB HEADER, 6 WAY, STRAIGHT, 2.5mm PITCH, SHROUDED, POLARISED, FRICTION LOCK,	MOLEX ELECTRONICS	22-03-5065
R1	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R5	24681/536	RESISTOR-NETWORK ISOLATED, THICK-FILM, 1K 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE MOUNTED,	VISHAY COMPONENTS	SOMC16-03-102-G-TUBE
R6	24681/536	RESISTOR-NETWORK ISOLATED, THICK-FILM, 1K 2% 600mW 50V 200 ppm/DEG.C, 8 RESISTORS, SURFACE MOUNTED,	VISHAY COMPONENTS	SOMC16-03-102-G-TUBE

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AB3 Mixer module (contd.)				
R7	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R8	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R9	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R10	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R11 to R13	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R17	24811/902	RESISTOR-FIXED METAL-FILM 16R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-16R2-1%
R19	24811/902	RESISTOR-FIXED METAL-FILM 16R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-16R2-1%
R24	24811/905	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-33R2-1%
R25	24811/905	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-33R2-1%
R26	24811/909	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-51R1-1%
R27	24811/193	RESISTOR-FIXED METAL-FILM 6K81 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-6K81-1%50ppm
R28	24811/184	RESISTOR-FIXED METAL-FILM 3K01 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K01-1%50ppm
R29	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R30	24811/929	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-27R4-1%
R31	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R32	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R33	24811/183	RESISTOR-FIXED METAL-FILM 2K74 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K74-1%50ppm
R34	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R35	24811/139	RESISTOR-FIXED METAL-FILM 39R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-39R2-1%50ppm
R36	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R37	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R38	24811/184	RESISTOR-FIXED METAL-FILM 3K01 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K01-1%50ppm
R39	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R40	24811/905	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-33R2-1%
R41 to R44	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R46	24811/903	RESISTOR-FIXED METAL-FILM 18R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-18R2-1%

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AB3	**Mixer module (contd.)**			
R47	24811/916	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-301R-1%
R48	24811/916	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-301R-1%
R49	24811/906	RESISTOR-FIXED METAL-FILM 36R5 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-36R5-1%
R50	24811/916	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-301R-1%
R51	24811/916	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-301R-1%
R54 to R56	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R69	24811/906	RESISTOR-FIXED METAL-FILM 36R5 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-36R5-1%
RLA to RLF	23486/181	RELAY MAGNETIC, SINGLE-POLE CHANGEOVER, POLARISED DUAL 5V COIL, 62R - LATCHING, ISOL 60dB @ 1.8GHz,	MATSUSHITA CONTROLS	RK1-L2-5V-H23
TR1 to TR10	28435/241	TRANSISTOR PNP BIPOLAR BCX17... 45V 100MHz 425mW 500mA 100hFE MIN @ 100mA, MARKING CODE T1, SURFACE	PHILIPS	BCX17
TR11	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR12	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR13	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369

AF1 VCXO and PLL

When ordering, prefix circuit reference with AF1.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829-851	Complete unit	Issue 08	
C1	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C2	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C3	26386/816	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-220-JP
C4	26878/407	CAPACITOR-VARIABLE POLYPROPYLENE 2pF to 22pF 100V VERTICAL-PCB MOUNT, 7.5mm DIA, 10mm LONG, 3 PIN,	PHILIPS	2222-808-11229
C5 to C14	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C16	26386/832	CAPACITOR-FIXED CERAMIC 470pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-471-JP
C17	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C18	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C19	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C20	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C21	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C22	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C23	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C24	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C25	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C26	26383/590	CAPACITOR-FIXED CERAMIC 3.9nF +/-10% 63V 2C2 SINGLELAYER, RADIAL, 2.5mm PWP, (TAPED).	PHILIPS	2222-630-51392
C27 to C29	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C30	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C31 to C35	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C40	26386/813	CAPACITOR-FIXED CERAMIC 12pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-120-JP
C41 to C47	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C48	26343/753	CAPACITOR-FIXED CERAMIC 6.8pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-6R8-DP
C49	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF1	**VCXO and PLL (contd.)**			
C50	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C51	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C52	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C53	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C54	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C55	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C56	26421/143	CAPACITOR-FIXED ALUMINIUM 470uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-U-471-B
C57	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C58	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C59	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C60	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C61	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C62	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C63	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C64	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C65	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C66	26421/116	CAPACITOR-FIXED ALUMINIUM 47uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, (LOOSE OR TAPED).	PANASONIC INDUSTRIAL	ECE-A-1C-KA-470-B
C67	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C68	26421/143	CAPACITOR-FIXED ALUMINIUM 470uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-U-471-B
C69	26343/753	CAPACITOR-FIXED CERAMIC 6.8pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-6R8-DP
C70	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C71	26421/143	CAPACITOR-FIXED ALUMINIUM 470uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-U-471-B
C72	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C73	26421/143	CAPACITOR-FIXED ALUMINIUM 470uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-0J-U-471-B

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF1	**VCXO and PLL (contd.)**			
D1	28381/530	DIODE VARIABLE CAPACITNCE, BB215... 30V 20mA 2.2pF @ 28V, CAPAC RATIO 7.6 MIN, MARKING GREEN, SURFACE	PHILIPS	BB215
D2 to D6	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D7 to D10	28349/022	DIODE SMALL-SIGNAL, SCHOTTKY, HSMS-2812... DUAL, 20V 1.2pF 410mVf @ 1mA, IN SERIES, MARKING CODE	HEWLETT-PACKARD	HSMS-2812-L31
D11	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D12	28371/443	DIODE ZENER, BZX84-C5V6... 350mW 5.6V 5% 250mA MARKING CODE Z3, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V6
D13	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
IC1	28464/034	IC-DIGITAL DIVIDER SP8789... DIVIDE BY 20/21, 225MHz, TWO MODULUS, ECL, 8 PIN, DUAL-IN-LINE.		
IC2	44535/191	IC-PROGRAMMED PAL, SET OF 1, 2031, 104.8576MHz DIVIDER.		
IC3	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC4	28466/393	IC-DIGITAL NAND-GATE 74HC132... 2 INPUT, QUAD, SCHMITT TRIGGER, CMOS-H/SPEED, 14 PIN,	PHILIPS	74HC132D
IC5	28461/412	IC-ANALOGUE OPERATIONAL AMP TL072... DUAL, 18V UNITY GAIN BNDWDTH 3MHz, OFFSET VOLTAGE 10mV, SLEW	MOTOROLA INC.	TL072CD
IC6	28464/038	IC-DIGITAL COUNTER 74F160A... 4 INPUT, 4 BIT, SINGLE, BCD, PRESETTABLE, SYNCHRONOUS,	NAT. SEMICONDUCTOR	74F160ASC
IC7	28464/176	IC-DIGITAL COUNTER 74ACT161... 4 BIT, SINGLE, BINARY MODULO-16, WITH PRESET & RESET,	NAT. SEMICONDUCTOR	74ACT161SC
IC8	28464/038	IC-DIGITAL COUNTER 74F160A... 4 INPUT, 4 BIT, SINGLE, BCD, PRESETTABLE, SYNCHRONOUS,	NAT. SEMICONDUCTOR	74F160ASC
IC9	28464/176	IC-DIGITAL COUNTER 74ACT161... 4 BIT, SINGLE, BINARY MODULO-16, WITH PRESET & RESET,	NAT. SEMICONDUCTOR	74ACT161SC
IC10	28469/066	IC-DIGITAL INVERTER 74ACT04... HEX, CMOS-ADVANCED+TTL, 14 PIN, SMALL-OUTLINE.	NAT. SEMICONDUCTOR	74ACT04SC
IC11	28461/454	IC-ANALOGUE MICROWAVE-AMP MSA-0786... 4V 22mA GAIN 12.5dB @ 1GHz, 3dB BANDWIDTH DC-2GHz, BIPOLAR, 4	HEWLETT-PACKARD	MSA-0786-TR1
IC12	28461/412	IC-ANALOGUE OPERATIONAL AMP TL072... DUAL, 18V UNITY GAIN BNDWDTH 3MHz, OFFSET VOLTAGE 10mV, SLEW	MOTOROLA INC.	TL072CD
L1	23642/520	INDUCTOR-FIXED 0.15uH +/- 20% EPOXY-MOULD, 450mA 0R25 MAX, 30 Q @ 25.2 MHz, 450 MHz SRF, SURFACE	TDK UK LTD	NL322522T-R15M
L2	23642/521	INDUCTOR-FIXED 0.39uH +/- 20% EPOXY-MOULD, 450mA 0R45 MAX, 30 Q @ 25.2 MHz, 250 MHz SRF, SURFACE	TDK UK LTD	NL322522T-R39M
L5	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L6	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L7	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF1	**VCXO and PLL (contd.)**			
L8	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L9	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J
L10	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% EPOXY-MOULD, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L11	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% EPOXY-MOULD, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L12	23642/705	INDUCTOR-FIXED 0.027uH +/- 10% EPOXY-MOULD, 450mA 0R22 MAX, 23 Q @ 100 MHz, 1.5K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-027-K
L15	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% EPOXY-MOULD, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L16	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% EPOXY-MOULD, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L17	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L18	23642/946	FILTER BANDPASS, PCB-MOUNT, HELICAL, 420MHz, 10.5MHz BANDWIDTH @ -1dB, 50R, DOUBLE TUNED,	TOKO (UK) LTD	7HW.252MXPR-2536A
L20	23642/704	INDUCTOR-FIXED 0.015uH +/- 10% EPOXY-MOULD, 450mA 0R14 MAX, 19 Q @ 100 MHz, 2.1K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-015-K
L22	23642/520	INDUCTOR-FIXED 0.15uH +/- 20% EPOXY-MOULD, 450mA 0R25 MAX, 30 Q @ 25.2 MHz, 450 MHz SRF, SURFACE	TDK UK LTD	NL322522T-R15M
R1	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R2	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R3	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R4	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R5	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R6	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R7	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R8	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R9	24811/129	RESISTOR-FIXED METAL-FILM 15R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-15R-1%-50ppm
R10	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R11	24811/163	RESISTOR-FIXED METAL-FILM 392R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-392R-1%50ppm
R12	24811/163	RESISTOR-FIXED METAL-FILM 392R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-392R-1%50ppm
R13	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF1	**VCXO and PLL (contd.)**			
R14	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R15	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R16	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R17	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R18	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R19	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R20	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R21	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R22	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R23	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R24	24811/221	RESISTOR-FIXED METAL-FILM 100K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100K-1%50ppm
R25	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R26	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R27	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R28	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R29	24811/222	RESISTOR-FIXED METAL-FILM 110K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-110K-1%50ppm
R30	24811/224	RESISTOR-FIXED METAL-FILM 130K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-130K-1%50ppm
R31	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R32	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R33	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R34	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R35	24811/223	RESISTOR-FIXED METAL-FILM 121K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-121K-1%50ppm
R36 to R38	24811/207	RESISTOR-FIXED METAL-FILM 27K4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27K4-1%50ppm
R39	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R40	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R41	24811/164	RESISTOR-FIXED METAL-FILM 432R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-432R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF1	**VCXO and PLL (contd.)**			
R42	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R43	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R44	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R45	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R46	24811/135	RESISTOR-FIXED METAL-FILM 27R4 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-27R4-1%50ppm
R47	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R48	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R49	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R50	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R51	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R52	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R53	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R54	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R55	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R56	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R57	24811/137	RESISTOR-FIXED METAL-FILM 33R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-33R2-1%50ppm
R58	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R59	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R60 to R63	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R64 to R67	24811/141	RESISTOR-FIXED METAL-FILM 47R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47R5-1%50ppm
R68	24811/134	RESISTOR-FIXED METAL-FILM 24R3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-24R3-1%50ppm
R69	24811/168	RESISTOR-FIXED METAL-FILM 619R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-619R-1%50ppm
T1	43590/232	WOUND-PART TRANSFORMER, RING-CORE, 6:6 TURNS, TWISTED BIFILAR WOUND, MOUNTED ON 6-PIN TOROID	AMETHYST DESIGNS LTD	AD5313
T2	43590/232	WOUND-PART TRANSFORMER, RING-CORE, 6:6 TURNS, TWISTED BIFILAR WOUND, MOUNTED ON 6-PIN TOROID	AMETHYST DESIGNS LTD	AD5313

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF1 VCXO and PLL (contd.)				
TR1 to TR9	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR10	28433/828	TRANSISTOR PNP BIPOLAR BC858B... 30V 150MHz 200mW 100mA 220hFE MIN @ 2mA, MARKING CODE 3K, SURFACE	PHILIPS	BC858B
TR11	28457/852	TRANSISTOR PNP BIPOLAR BSR15... 40V 200MHz 300mW 600mA MARKING CODE CH/T7p, SURFACE MOUNTED,	PHILIPS	BSR15
XL1	28312/116	CRYSTAL 0 MHz +/- 10 ppm, SEE MI DRG, SERIES RESONANCE, 2.3mH - 40R ESR MAX, EXACT FREQ	HY-Q INTERNATIONAL	HT60966-01

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number

AF2 RF oscillator (earlier version)

When ordering, prefix circuit reference with AF2.

	44829-852	Complete unit	Issue 12	
C1	26421/151	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-310-G-C0
C2 to C4	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C5	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C6	26421/114	CAPACITOR-FIXED ALUMINIUM 22uF +/-20% 25V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1E-KA-220-B
C7	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C8	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C9	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C10	26421/114	CAPACITOR-FIXED ALUMINIUM 22uF +/-20% 25V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1E-KA-220-B
C11	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C12	26421/114	CAPACITOR-FIXED ALUMINIUM 22uF +/-20% 25V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1E-KA-220-B
C13	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C14	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C15	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C16	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C17	26582/435	CAPACITOR-FIXED POLYESTER 33nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (LOOSE OR TAPED).	VISHAY COMPONENTS	MKT-1817-333/015
C18	26582/435	CAPACITOR-FIXED POLYESTER 33nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (LOOSE OR TAPED).	VISHAY COMPONENTS	MKT-1817-333/015
C19	26582/431	CAPACITOR-FIXED POLYESTER 22nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1817-322/015
C20	26582/431	CAPACITOR-FIXED POLYESTER 22nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1817-322/015
C22	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C23	26582/439	CAPACITOR-FIXED POLYESTER 680nF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-468/065
C24	26582/439	CAPACITOR-FIXED POLYESTER 680nF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-468/065
C25	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2	**RF oscillator (earlier version) (contd.)**			
C26	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C27	26386/975	CAPACITOR-FIXED CERAMIC 6.8pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-6R8-BAW-TR
C28	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C29	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C30	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C31	26386/954	CAPACITOR-FIXED CERAMIC 8.2pF +/-0.25pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-8R2-CAW-TR
C32	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C33	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C34 to C36	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C37	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C38	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C39 to C41	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C42 to C45	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C46	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C47 to C54	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C55 to C65	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C67	26421/153	CAPACITOR-FIXED ALUMINIUM 470uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-347-C-C0
C68	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C69	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C70	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C71	26386/867	CAPACITOR-FIXED CERAMIC 2.2nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-222-KP
C72	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C73	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C74	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C80 to C82	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C83	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2	**RF oscillator (earlier version) (contd.)**			
C84	26582/440	CAPACITOR-FIXED POLYESTER 4.7nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (LOOSE OR TAPED).	EVOX-RIFA	MMK5-472K100-TR18
C85	26582/440	CAPACITOR-FIXED POLYESTER 4.7nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (LOOSE OR TAPED).	EVOX-RIFA	MMK5-472K100-TR18
D1	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D2	28371/443	DIODE ZENER, BZX84-C5V6... 350mW 5.6V 5% 250mA MARKING CODE Z3, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V6
D3 to D5	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D6	28371/443	DIODE ZENER, BZX84-C5V6... 350mW 5.6V 5% 250mA MARKING CODE Z3, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V6
D7	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D8	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D9	28381/133	DIODE VARIABLE CAPACITNCE, BB515... 30V 11.5pF @ 3V, CAPAC RATIO 8.0 MIN, SURFACE MOUNTED, SOD-123,	SIEMENS LTD	BB515-B
D10	28335/670	DIODE BAND SWITCHING, BAT18... 35V 100mA 1pF MAX @ 20V, 1.2Vf @ 100mA, MARKING CODE A2, SURFACE	PHILIPS	BAT18/T1
D11	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D12	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
IC1	28461/741	IC-ANALOGUE VOLTAGE-REGULATOR LM317L... 37V 100mA POSITIVE ADJUSTABLE, LINEAR, MONOLITHIC, 3 PIN,	NAT. SEMICONDUCTOR	LM317LZ
IC2	28461/412	IC-ANALOGUE OPERATIONAL AMP TL072... DUAL, 18V UNITY GAIN BNDWDTH 3MHz, OFFSET VOLTAGE 10mV, SLEW	MOTOROLA INC.	TL072CD
IC3	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC4	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC5	28466/390	IC-DIGITAL NAND-GATE 74HC00... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC00D
IC6	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	SILICONIX LTD	DG441DY
IC7	28461/450	IC-ANALOGUE MICROWAVE-AMPLIFIER MSA-0486... 5.25V 50mA GAIN 8dB @ 1GHz, 3dB BANDWIDTH DC-3.2GHz,	HEWLETT-PACKARD	MSA-0486
IC8	28461/454	IC-ANALOGUE MICROWAVE-AMPLIFIER MSA-0786... 4V 22mA GAIN 12.5dB @ 1GHz, 3dB BANDWIDTH DC-2GHz,	HEWLETT-PACKARD	MSA-0786-TRI
IC9	28469/522	IC-DIGITAL DIVIDER SP4902... DIVIDE BY 2, 2.54GHz, PRESCALER, ECL, 8 PIN, DUAL-IN-LINE.	GEC PLESSEY SEMICOND	SP4902DP8
IC10	28461/454	IC-ANALOGUE MICROWAVE-AMPLIFIER MSA-0786... 4V 22mA GAIN 12.5dB @ 1GHz, 3dB BANDWIDTH DC-2GHz,	HEWLETT-PACKARD	MSA-0786-TRI
IC11	28467/110	IC-MICRO PERIPHERAL, PCF8574A... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 16 DEVICE ADDRESS	PHILIPS	PCF8574AT

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2	**RF oscillator (earlier version) (contd.)**			
IC12	28467/110	IC-MICRO PERIPHERAL, PCF8574A... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 16 DEVICE ADDRESS	PHILIPS	PCF8574AT
IC13	28461/898	IC-ANALOGUE D/A-CONVERTER 7528... 8 INPUT, DUAL, 8-BIT, BUFFERED, MULTIPLYING, CMOS, 20 PIN,	ANALOG DEVICES LTD	AD7528JR
IC14	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC15	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC16	28461/896	IC-ANALOGUE SWITCH DG413... QUAD, 15V SPST, ON-RESISTANCE<35R, 2 x N/O & 2 x N/C @ LOGIC 1,	SILICONIX LTD	DG413DY
IC17	28461/896	IC-ANALOGUE SWITCH DG413... QUAD, 15V SPST, ON-RESISTANCE<35R, 2 x N/O & 2 x N/C @ LOGIC 1,	SILICONIX LTD	DG413DY
IC18	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC19	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
L1 to L4	23642/333	INDUCTOR-FIXED 470uH +/- 10% SCREENED, MOULDED-EPOXY, 310mA 3R3 MAX, 90 Q @ 0.79 MHz, 3	INTERCONNECTION PROD	553-3635-33-02-00
L5	23642/362	INDUCTOR-FIXED 10mH +/- 10% SCREENED, MOULDED-EPOXY, 69mA 75R MAX, 70 Q @ 0.25 MHz, 0.7	INTERCONNECTION PROD	553-3635-49-02-00
L6	23642/362	INDUCTOR-FIXED 10mH +/- 10% SCREENED, MOULDED-EPOXY, 69mA 75R MAX, 70 Q @ 0.25 MHz, 0.7	INTERCONNECTION PROD	553-3635-49-02-00
L8 to L15	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% MOULDED-EPOXY, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
PLA	23436/776	CONNECTOR MULTIWAY, PLUG, 20 WAY, SNAP OFF STRIP, STRAIGHT, 2.54mm PITCH, PCB MOUNTING, SOLDER PIN	HARWIN ENGINEERS LTD	DO1-9922005
PLB	23436/776	CONNECTOR MULTIWAY, PLUG, 20 WAY, SNAP OFF STRIP, STRAIGHT, 2.54mm PITCH, PCB MOUNTING, SOLDER PIN	HARWIN ENGINEERS LTD	DO1-9922005
R1	24811/158	RESISTOR-FIXED METAL-FILM 243R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-243R-1%50ppm
R2	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R3	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R4	24811/223	RESISTOR-FIXED METAL-FILM 121K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-121K-1%50ppm
R5	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R6	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R7	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R8	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2		**RF oscillator (earlier version) (contd.)**		
R9	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R10	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R11	24811/223	RESISTOR-FIXED METAL-FILM 121K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-121K-1%50ppm
R12	24811/134	RESISTOR-FIXED METAL-FILM 24R3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-24R3-1%50ppm
R13	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R14	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R15	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R16	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R17 to R19	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R20	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R21	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R22	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R23	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R24	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R25	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R26	24811/170	RESISTOR-FIXED METAL-FILM 750R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-750R-1%50ppm
R27	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R30	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R31	24811/170	RESISTOR-FIXED METAL-FILM 750R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-750R-1%50ppm
R32	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R33	24811/177	RESISTOR-FIXED METAL-FILM 1K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K5-1%50ppm
R34	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R35	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R36	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R37	24811/155	RESISTOR-FIXED METAL-FILM 182R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-182R-1%50ppm
R38	24811/133	RESISTOR-FIXED METAL-FILM 22R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22R1-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2	**RF oscillator (earlier version) (contd.)**			
R39	24811/143	RESISTOR-FIXED METAL-FILM 56R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56R2-1%50ppm
R40	24772/057	RESISTOR-FIXED METAL-FILM 220R +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-220R-2%
R41	24811/901	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-10R-1%
R42	24811/901	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-10R-1%
R43	24772/067	RESISTOR-FIXED METAL-FILM 560R +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-560R-2%
R44 to R46	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R47	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R48	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R49	24811/902	RESISTOR-FIXED METAL-FILM 16R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-16R2-1%
R50	24811/910	RESISTOR-FIXED METAL-FILM 61R9 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-61R9-1%
R51	24811/910	RESISTOR-FIXED METAL-FILM 61R9 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-61R9-1%
R52	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R53	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R54	24338/004	RESISTOR-FIXED METAL-GLAZE 150R +/- 5% 1W 100V 350 ppm/DEG.C, SURFACE MOUNTED, SIZE 2512, (12mm	VISHAY COMPONENTS	CR2512-150R-5%-P4
R55	24811/134	RESISTOR-FIXED METAL-FILM 24R3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-24R3-1%50ppm
R56	24811/134	RESISTOR-FIXED METAL-FILM 24R3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-24R3-1%50ppm
R57	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R58	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R59	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R60 to R63	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R64	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15
R65	24811/606	RESISTOR-FIXED METAL-FILM 1K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K0-0.1%-15
R66	24811/617	RESISTOR-FIXED METAL-FILM 110R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-110R-0.1%-15
R67	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R68	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R69	24811/602	RESISTOR-FIXED METAL-FILM 10K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-10K0-0.1%-15

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2	**RF oscillator (earlier version) (contd.)**			
R70	24811/618	RESISTOR-FIXED METAL-FILM 100R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-0.1%-15
R71	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R72	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R73	24811/170	RESISTOR-FIXED METAL-FILM 750R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-750R-1%50ppm
R74 to R76	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R77 to R80	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R81	24811/919	RESISTOR-FIXED METAL-FILM 15R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-15R0-1%
R82	24811/902	RESISTOR-FIXED METAL-FILM 16R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-16R2-1%
R83	24811/919	RESISTOR-FIXED METAL-FILM 15R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-15R0-1%
R84	24811/906	RESISTOR-FIXED METAL-FILM 36R5 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-36R5-1%
R85	24811/906	RESISTOR-FIXED METAL-FILM 36R5 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-36R5-1%
R90 to R95	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R96	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R97	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
SKJ	23435/990	CONNECTOR SHORTING, SOCKET, 2 WAY, FOR 0.64mm SQ PINS, 2.54mm PITCH, 9.6mm HIGH, FREE MOUNTING,	BERG ELECTRONICS	65474-001
TR1	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR2	28433/828	TRANSISTOR PNP BIPOLAR BC858B... 30V 150MHz 200mW 100mA 220hFE MIN @ 2mA, MARKING CODE 3K, SURFACE	PHILIPS	BC858B
TR3	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR4	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR5	28433/828	TRANSISTOR PNP BIPOLAR BC858B... 30V 150MHz 200mW 100mA 220hFE MIN @ 2mA, MARKING CODE 3K, SURFACE	PHILIPS	BC858B
TR6	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR7	28433/828	TRANSISTOR PNP BIPOLAR BC858B... 30V 150MHz 200mW 100mA 220hFE MIN @ 2mA, MARKING CODE 3K, SURFACE	PHILIPS	BC858B
TR8	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2 RF oscillator (earlier version) (contd.)				
TR9	28433/828	TRANSISTOR PNP BIPOLAR BC858B... 30V 150MHz 200mW 100mA 220hFE MIN @ 2mA, MARKING CODE 3K, SURFACE	PHILIPS	BC858B
TR10	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR11	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR12 to TR14	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A

AF2 RF oscillator (later version)

When ordering, prefix circuit reference with AF2.

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
	44829-852	Complete unit	Issue 21	
C1	26421/151	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-310-G-C0
C2 to C4	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C5	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C6	26421/114	CAPACITOR-FIXED ALUMINIUM 22uF +/-20% 25V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1E-KA-220-B
C7	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C8	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C9	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C10	26421/114	CAPACITOR-FIXED ALUMINIUM 22uF +/-20% 25V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1E-KA-220-B
C11	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C12	26421/114	CAPACITOR-FIXED ALUMINIUM 22uF +/-20% 25V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1E-KA-220-B
C13	26582/432	CAPACITOR-FIXED POLYESTER 1uF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-510/065
C14	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C15	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C16	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C17	26582/431	CAPACITOR-FIXED POLYESTER 22nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1817-322/015
C18	26582/431	CAPACITOR-FIXED POLYESTER 22nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1817-322/015
C22	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C23	26582/439	CAPACITOR-FIXED POLYESTER 680nF +/-10% 50V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-468/065
C24	26582/427	CAPACITOR-FIXED POLYESTER 470nF +/-10% 63V 330 ppm/DEG.C, RADIAL, 5mm PWP, (TAPED).	VISHAY COMPONENTS	MKT-1826-447/065
C25	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C26	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C27	26386/973	CAPACITOR-FIXED CERAMIC 3.3pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-3R3-BAW-TR
C28	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C29	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2	**RF oscillator (later version) (contd.)**			
C30	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C31	26386/954	CAPACITOR-FIXED CERAMIC 8.2pF +/-0.25pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-8R2-CAW-TR
C32	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C33	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C34 to C36	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C37	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C38	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C39 to C41	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C42 to C45	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C46	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C47 to C54	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C55	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C56	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C57 to C61	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C62 to C65	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C67	26421/153	CAPACITOR-FIXED ALUMINIUM 470uF +/-20% 6.3V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-347-C-C0
C68	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C69	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C70	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C71	26386/867	CAPACITOR-FIXED CERAMIC 2.2nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-222-KP
C72	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C73	26421/152	CAPACITOR-FIXED ALUMINIUM 220uF +/-20% 16V ELECTROLYTIC, RADIAL, 5mm PWP, 9mm MAX BODY DIA,	VISHAY COMPONENTS	EKS-00-CC-322-D-C0
C74	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C80 to C82	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C83	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C100 to C102	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2	**RF oscillator (later version) (contd.)**			
C103	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C104	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C127	26386/972	CAPACITOR-FIXED CERAMIC 2.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-2R7-BAW-TR
D1	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D2	28371/443	DIODE ZENER, BZX84-C5V6... 350mW 5.6V 5% 250mA MARKING CODE Z3, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V6
D3 to D5	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D6	28371/443	DIODE ZENER, BZX84-C5V6... 350mW 5.6V 5% 250mA MARKING CODE Z3, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V6
D7	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D8	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D9	28381/133	DIODE VARIABLE CAPACITNCE, BB515... 30V 20mA 2.1pF @ 28V, CAPAC RATIO 8.0 MIN, SURFACE MOUNTED,	SIEMENS LTD	BB515
D10	28335/670	DIODE BAND SWITCHING, BAT18... 35V 100mA 1pF MAX @ 20V, 1.2Vf @ 100mA, MARKING CODE A2, SURFACE	PHILIPS	BAT18/T1
D13	28371/443	DIODE ZENER, BZX84-C5V6... 350mW 5.6V 5% 250mA MARKING CODE Z3, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V6
D14	28371/443	DIODE ZENER, BZX84-C5V6... 350mW 5.6V 5% 250mA MARKING CODE Z3, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V6
IC1	28461/741	IC-ANALOGUE VOLTAGE-REGULATOR LM317L... 37V 100mA POSITIVE ADJUSTABLE, LINEAR, MONOLITHIC, 3 PIN,	NAT. SEMICONDUCTOR	LM317LZ
IC2	28461/412	IC-ANALOGUE OPERATIONAL AMP TL072... DUAL, 18V UNITY GAIN BNDWDTH 3MHz, OFFSET VOLTAGE 10mV, SLEW	MOTOROLA INC.	TL072CD
IC3	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC4	28462/638	IC-DIGITAL FLIP-FLOP/D-TYPE 74HC74... 2 BIT, DUAL, POS EDGE TRIGGER, PLUS SET & CLEAR, CMOS-H/SPEED,	PHILIPS	74HC74D
IC5	28466/390	IC-DIGITAL NAND-GATE 74HC00... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC00D
IC6	28461/999	IC-ANALOGUE SWITCH DG441... QUAD, 15V SPST, ON-RESISTANCE<85R, 4 x N/O @ LOGIC 1, TTL	TEMIC UK LTD	DG441DY
IC7	28461/450	IC-ANALOGUE MICROWAVE-AMP MSA-0486... 5.25V 50mA GAIN 8dB @ 1GHz, 3dB BANDWIDTH DC-3.2GHz, BIPOLAR,	HEWLETT-PACKARD	MSA-0486-TR1
IC8	28461/454	IC-ANALOGUE MICROWAVE-AMP MSA-0786... 4V 22mA GAIN 12.5dB @ 1GHz, 3dB BANDWIDTH DC-2GHz, BIPOLAR, 4	HEWLETT-PACKARD	MSA-0786-TR1
IC9	28469/522	IC-DIGITAL DIVIDER SP4902... DIVIDE BY 2, 2.54GHz, PRESCALER, ECL, 8 PIN, DUAL-IN-LINE.		
IC10	28461/454	IC-ANALOGUE MICROWAVE-AMP MSA-0786... 4V 22mA GAIN 12.5dB @ 1GHz, 3dB BANDWIDTH DC-2GHz, BIPOLAR, 4	HEWLETT-PACKARD	MSA-0786-TR1

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2	**RF oscillator (later version) (contd.)**			
IC11	28467/110	IC-MICRO PERIPHERAL, PCF8574A... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 16 DEVICE ADDRESS	PHILIPS	PCF8574AT
IC12	28467/110	IC-MICRO PERIPHERAL, PCF8574A... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 16 DEVICE ADDRESS	PHILIPS	PCF8574AT
IC13	28461/898	IC-ANALOGUE D/A-CONVERTER 7528... 8 INPUT, DUAL, 8-BIT, BUFFERED, MULTIPLYING, CMOS, 20 PIN,	ANALOG DEVICES LTD	AD7528JR
IC14	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC15	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC16	28461/896	IC-ANALOGUE SWITCH DG413... QUAD, 15V SPST, ON-RESISTANCE<35R, 2 x N/O & 2 x N/C @ LOGIC 1,	TEMIC UK LTD	DG413DY
IC17	28461/896	IC-ANALOGUE SWITCH DG413... QUAD, 15V SPST, ON-RESISTANCE<35R, 2 x N/O & 2 x N/C @ LOGIC 1,	TEMIC UK LTD	DG413DY
IC18	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
IC19	28461/897	IC-ANALOGUE OPERATIONAL AMP OP-27GS... 22V LOW NOISE, 8 PIN, SMALL-OUTLINE.	ANALOG DEVICES LTD	OP-27GS
L1 to L4	23642/333	INDUCTOR-FIXED 470uH +/- 10% SCREENED, EPOXY-MOULD, 310mA 3R3 MAX, 90 Q @ 0.79 MHz, 3 MHz	VISHAY COMPONENTS	VL471K
L5	23642/362	INDUCTOR-FIXED 10mH +/- 10% SCREENED, EPOXY-MOULD, 69mA 75R MAX, 70 Q @ 0.25 MHz, 0.7 MHz SRF,	VISHAY COMPONENTS	VL103K
L6	23642/362	INDUCTOR-FIXED 10mH +/- 10% SCREENED, EPOXY-MOULD, 69mA 75R MAX, 70 Q @ 0.25 MHz, 0.7 MHz SRF,	VISHAY COMPONENTS	VL103K
L8 to L14	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% EPOXY-MOULD, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L15	23642/703	INDUCTOR-FIXED 0.47uH +/- 10% EPOXY-MOULD, 450mA 0R5 MAX, 30 Q @ 25.2 MHz, 220 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R47-K
R1	24811/158	RESISTOR-FIXED METAL-FILM 243R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-243R-1%50ppm
R2	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R3	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R4	24811/223	RESISTOR-FIXED METAL-FILM 121K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-121K-1%50ppm
R5	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R6	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R7	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R8	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R9	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2	**RF oscillator (later version) (contd.)**			
R10	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R11	24811/223	RESISTOR-FIXED METAL-FILM 121K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-121K-1%50ppm
R12	24811/134	RESISTOR-FIXED METAL-FILM 24R3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-24R3-1%50ppm
R13	24811/245	RESISTOR-FIXED METAL-FILM 1M +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1M0-1%50ppm
R14	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R15	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R16	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R17 to R19	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R20	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R21	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R22	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R23	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R24	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R25	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R26	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R27	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R30	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R31	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R32	24811/176	RESISTOR-FIXED METAL-FILM 1K3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K3-1%50ppm
R33	24811/176	RESISTOR-FIXED METAL-FILM 1K3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K3-1%50ppm
R34	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R35	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R36	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R37	24811/101	RESISTOR-FIXED METAL-FILM 1R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1R-1%-50ppm
R38	24811/133	RESISTOR-FIXED METAL-FILM 22R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22R1-1%50ppm
R39	24811/143	RESISTOR-FIXED METAL-FILM 56R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-56R2-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2	**RF oscillator (later version) (contd.)**			
R40	24772/057	RESISTOR-FIXED METAL-FILM 220R +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-220R-2%
R41	24811/901	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-10R-1%
R42	24811/901	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-10R-1%
R43	24772/067	RESISTOR-FIXED METAL-FILM 560R +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-560R-2%
R44 to R46	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R47	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R48	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R49	24811/902	RESISTOR-FIXED METAL-FILM 16R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-16R2-1%
R50	24811/910	RESISTOR-FIXED METAL-FILM 61R9 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-61R9-1%
R51	24811/910	RESISTOR-FIXED METAL-FILM 61R9 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-61R9-1%
R52	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R53	24811/175	RESISTOR-FIXED METAL-FILM 1K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K21-1%50ppm
R54	24338/004	RESISTOR-FIXED METAL-GLAZE 150R +/- 5% 1W 100V 350 ppm/DEG.C, SURFACE MOUNTED, SIZE 2512, (12mm	VISHAY COMPONENTS	CR2512-150R-5%-P4
R55	24811/134	RESISTOR-FIXED METAL-FILM 24R3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-24R3-1%50ppm
R56	24811/134	RESISTOR-FIXED METAL-FILM 24R3 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-24R3-1%50ppm
R59	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R60 to R63	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R64	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R65	24811/606	RESISTOR-FIXED METAL-FILM 1K +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-1K0-0.1%-15
R66	24811/617	RESISTOR-FIXED METAL-FILM 110R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-110R-0.1%-15
R67	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R68	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R69	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R70	24811/618	RESISTOR-FIXED METAL-FILM 100R +/- 0.1% 250mW 200V 15 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-0.1%-15
R71	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R72	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2 RF oscillator (later version) (contd.)				
R73	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R74 to R76	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R77 to R80	24811/125	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10R-1%-50ppm
R81	24811/919	RESISTOR-FIXED METAL-FILM 15R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-15R0-1%
R82	24811/902	RESISTOR-FIXED METAL-FILM 16R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-16R2-1%
R83	24811/919	RESISTOR-FIXED METAL-FILM 15R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-15R0-1%
R84	24811/906	RESISTOR-FIXED METAL-FILM 36R5 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-36R5-1%
R85	24811/906	RESISTOR-FIXED METAL-FILM 36R5 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-36R5-1%
R90 to R95	24811/225	RESISTOR-FIXED METAL-FILM 150K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150K-1%50ppm
R96	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R97	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R100	24811/101	RESISTOR-FIXED METAL-FILM 1R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1R-1%-50ppm
R101	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R102	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R103	24811/181	RESISTOR-FIXED METAL-FILM 2K21 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K21-1%50ppm
R104	24811/163	RESISTOR-FIXED METAL-FILM 392R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-392R-1%50ppm
R105	24811/163	RESISTOR-FIXED METAL-FILM 392R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-392R-1%50ppm
R106	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
SKJ	23435/990	CONNECTOR SHORTING, SOCKET, 2 WAY, FOR 0.64mm SQ PINS, 2.54mm PITCH, 9.6mm HIGH, FREE MOUNTING,	BERG ELECTRONICS	65474-001
TR1	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE @ 2mA, NOISE 2dB @ 1KHz, MARKING CODE	PHILIPS	BC848B
TR2	28433/828	TRANSISTOR PNP BIPOLAR BC858B... 30V 150MHz 200mW 100mA 220hFE MIN @ 2mA, MARKING CODE 3K, SURFACE	PHILIPS	BC858B
TR3	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR4	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE @ 2mA, NOISE 2dB @ 1KHz, MARKING CODE	PHILIPS	BC848B

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF2	**RF oscillator (later version) (contd.)**			
TR5	28433/828	TRANSISTOR PNP BIPOLAR BC858B... 30V 150MHz 200mW 100mA 220hFE MIN @ 2mA, MARKING CODE 3K, SURFACE	PHILIPS	BC858B
TR6	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE @ 2mA, NOISE 2dB @ 1KHz, MARKING CODE	PHILIPS	BC848B
TR7	28433/828	TRANSISTOR PNP BIPOLAR BC858B... 30V 150MHz 200mW 100mA 220hFE MIN @ 2mA, MARKING CODE 3K, SURFACE	PHILIPS	BC858B
TR8	28457/850	TRANSISTOR NPN BIPOLAR FMMT2369... 40V 600MHz 300mW 500mA 40hFE MIN @ 10mA, MARKING CODE *1J,	PHILIPS	PMBT2369
TR9	28433/828	TRANSISTOR PNP BIPOLAR BC858B... 30V 150MHz 200mW 100mA 220hFE MIN @ 2mA, MARKING CODE 3K, SURFACE	PHILIPS	BC858B
TR10	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE @ 2mA, NOISE 2dB @ 1KHz, MARKING CODE	PHILIPS	BC848B
TR11	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE @ 2mA, NOISE 2dB @ 1KHz, MARKING CODE	PHILIPS	BC848B
TR12 to TR14	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR15	28433/828	TRANSISTOR PNP BIPOLAR BC858B... 30V 150MHz 200mW 100mA 220hFE MIN @ 2mA, MARKING CODE 3K, SURFACE	PHILIPS	BC858B
TR16	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE @ 2mA, NOISE 2dB @ 1KHz, MARKING CODE	PHILIPS	BC848B

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF3 VCO				
		When ordering, prefix circuit reference with AF3.		
	44829-853	Complete unit	Issue 06	
C1	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C2	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C3	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C4	26386/975	CAPACITOR-FIXED CERAMIC 6.8pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-6R8-BAW-TR
C5	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C6	26386/830	CAPACITOR-FIXED CERAMIC 330pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-331-JP
C7	26386/808	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-4R7-DP
C8	26343/753	CAPACITOR-FIXED CERAMIC 6.8pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-6R8-DP
C9	26386/803	CAPACITOR-FIXED CERAMIC 1.8pF +/-0.5pF 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-1R8-DP
C10	26386/898	CAPACITOR-FIXED CERAMIC 5.6pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K5R6-BAW-TR
D1	28381/133	DIODE VARIABLE CAPACITNCE, BB515... 30V 20mA 2.1pF @ 28V, CAPAC RATIO 8.0 MIN, SURFACE MOUNTED,	SIEMENS LTD	BB515
D2	28381/133	DIODE VARIABLE CAPACITNCE, BB515... 30V 20mA 2.1pF @ 28V, CAPAC RATIO 8.0 MIN, SURFACE MOUNTED,	SIEMENS LTD	BB515
D3	28383/961	DIODE PIN, BAR16-1... DUAL, 140mW 100V 100mA 0.5pF 1.25Vf @ 100mA, COMMON ANODE, MARKING CODE L9,	SIEMENS LTD	BAR16-1
L1	23642/703	INDUCTOR-FIXED 0.47uH +/- 10% EPOXY-MOULD, 450mA 0R5 MAX, 30 Q @ 25.2 MHz, 220 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R47-K
L2	23642/703	INDUCTOR-FIXED 0.47uH +/- 10% EPOXY-MOULD, 450mA 0R5 MAX, 30 Q @ 25.2 MHz, 220 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R47-K
R1	24772/057	RESISTOR-FIXED METAL-FILM 220R +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-220R-2%
R2	24772/057	RESISTOR-FIXED METAL-FILM 220R +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-220R-2%
R3 to R6	24811/901	RESISTOR-FIXED METAL-FILM 10R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-10R-1%
R7	24772/067	RESISTOR-FIXED METAL-FILM 560R +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (TAPED).	VISHAY COMPONENTS	NK3-560R-2%
R8	24772/060	RESISTOR-FIXED METAL-FILM 300R +/- 2% 125mW 150V 100 ppm/DEG.C, AXIAL, (LOOSE OR TAPED).	VISHAY COMPONENTS	NK3-270R-2%

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF3 VCO (contd.)				
R9	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R10	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R11	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
SKA	23436/740	CONNECTOR MULTIWAY, SOCKET, 5 WAY, STRAIGHT, 2.54mm PITCH, PCB MOUNTING, CONTACTS GOLD PLATED	BERG ELECTRONICS	76308-105
SKB	23436/740	CONNECTOR MULTIWAY, SOCKET, 5 WAY, STRAIGHT, 2.54mm PITCH, PCB MOUNTING, CONTACTS GOLD PLATED	BERG ELECTRONICS	76308-105
TR1	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR2	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number

AF4 RF divider

When ordering, prefix circuit reference with AF4.

	44829-854	Complete unit	Issue 08	
C1 to C11	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C12	26343/753	CAPACITOR-FIXED CERAMIC 6.8pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-6R8-DP
C13 to C16	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C17 to C24	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C25	26386/973	CAPACITOR-FIXED CERAMIC 3.3pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-3R3-BAW-TR
C26	26386/986	CAPACITOR-FIXED CERAMIC 1.8pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-1R8-BAW-TR
C27	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C28	26386/975	CAPACITOR-FIXED CERAMIC 6.8pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-6R8-BAW-TR
C29	26386/970	CAPACITOR-FIXED CERAMIC 1.5pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-1R5-BAW-TR
C30	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C31	26386/897	CAPACITOR-FIXED CERAMIC 4.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K4R7-BAW-TR
C32	26386/985	CAPACITOR-FIXED CERAMIC 1.2pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-1R2-BAW-TR
C33	26343/753	CAPACITOR-FIXED CERAMIC 6.8pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-6R8-DP
C34	26386/973	CAPACITOR-FIXED CERAMIC 3.3pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-3R3-BAW-TR
C35	26386/972	CAPACITOR-FIXED CERAMIC 2.7pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-2R7-BAW-TR
C36 to C38	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C39	26343/753	CAPACITOR-FIXED CERAMIC 6.8pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-6R8-DP
C40 to C43	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C44	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C45	26386/971	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-2R2-BAW-TR
C46	26386/815	CAPACITOR-FIXED CERAMIC 18pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-180-JP
C47	26343/753	CAPACITOR-FIXED CERAMIC 6.8pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-6R8-DP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF4	**RF divider (contd.)**			
C48	26343/753	CAPACITOR-FIXED CERAMIC 6.8pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-6R8-DP
C49	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C50	26386/813	CAPACITOR-FIXED CERAMIC 12pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-120-JP
C51	26386/971	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-2R2-BAW-TR
C52	26386/815	CAPACITOR-FIXED CERAMIC 18pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-180-JP
C53	26386/898	CAPACITOR-FIXED CERAMIC 5.6pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K5R6-BAW-TR
C54	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C55	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C56	26386/814	CAPACITOR-FIXED CERAMIC 15pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-150-JP
C57	26386/973	CAPACITOR-FIXED CERAMIC 3.3pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-3R3-BAW-TR
C58	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C59	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C60	26386/814	CAPACITOR-FIXED CERAMIC 15pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-150-JP
C61 to C64	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C65	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C66	26343/753	CAPACITOR-FIXED CERAMIC 6.8pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-6R8-DP
C67	26343/784	CAPACITOR-FIXED CERAMIC 68pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-680-JP
C68	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C69	26386/816	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-220-JP
C70	26386/816	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-220-JP
C71 to C75	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C76	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C77	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C78 to C85	26386/881	CAPACITOR-FIXED CERAMIC 33nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-333-KP
C86 to C89	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C90	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF4 RF divider (contd.)				
C91 to C95	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C96	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C99 to C105	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C111	26386/813	CAPACITOR-FIXED CERAMIC 12pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-120-JP
C112	26386/823	CAPACITOR-FIXED CERAMIC 82pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-820-JP
C113	26386/764	CAPACITOR-FIXED CERAMIC 47pF +/-5% 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-470-JAW
C114	26386/816	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-220-JP
C115	26386/815	CAPACITOR-FIXED CERAMIC 18pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-180-JP
C116	26343/753	CAPACITOR-FIXED CERAMIC 6.8pF +/-0.5pF 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-6R8-DP
C117	26386/819	CAPACITOR-FIXED CERAMIC 39pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-390-JP
C118	26386/762	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-220-JAW
C119	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C120	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C121	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
D1 to D53	28335/670	DIODE BAND SWITCHING, BAT18... 35V 100mA 1pF MAX @ 20V, 1.2Vf @ 100mA, MARKING CODE A2, SURFACE	PHILIPS	BAT18/T1
IC1	28467/111	IC-MICRO PERIPHERAL, PCF8574... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 8 DEVICE ADDRESS	PHILIPS	PCF8574T
IC2	28466/390	IC-DIGITAL NAND-GATE 74HC00... 2 INPUT, QUAD, CMOS-H/SPEED, 14 PIN, SMALL-OUTLINE.	PHILIPS	74HC00D
IC3	28465/065	IC-DIGITAL DECODER/DEMULTIPLEX 74HC154... 4-TO-16 LINE, CMOS-H/SPEED, 24 PIN, SMALL-OUTLINE.	PHILIPS	74HC154D
IC4 to IC6	28461/388	IC-ANALOGUE OPERATIONAL AMP LM324D... QUAD, GEN-PURPOSE, SLEW RATE 0.2V/uS MIN, GAIN BANDWIDTH	PHILIPS	LM324D
IC7	28469/566	IC-DIGITAL DIVIDER SP8402... DIVIDE BY 2 TO 256 SELECTABLE BY 2n, 1.5GHz, PHASE NOISE <160 dBc/Hz,	GEC PLESSEY SEMICOND	SP8402
IC8	28461/388	IC-ANALOGUE OPERATIONAL AMP LM324D... QUAD, GEN-PURPOSE, SLEW RATE 0.2V/uS MIN, GAIN BANDWIDTH	PHILIPS	LM324D
IC9	28461/454	IC-ANALOGUE MICROWAVE-AMPLIFIER MSA-0786... 4V 22mA GAIN 12.5dB @ 1GHz, 3dB BANDWIDTH DC-2GHz,	HEWLETT-PACKARD	MSA-0786-TRI

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF4	**RF divider (contd.)**			
L1	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% MOULDED-EPOXY, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L2	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% MOULDED-EPOXY, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L8	23642/714	INDUCTOR-FIXED 1.5uH +/- 5% MOULDED-EPOXY, 370mA 0R85 MAX, 30 Q @ 7.96 MHz, 85 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R5-J
L9 to L19	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% MOULDED-EPOXY, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L22	23642/714	INDUCTOR-FIXED 1.5uH +/- 5% MOULDED-EPOXY, 370mA 0R85 MAX, 30 Q @ 7.96 MHz, 85 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R5-J
L25	23642/714	INDUCTOR-FIXED 1.5uH +/- 5% MOULDED-EPOXY, 370mA 0R85 MAX, 30 Q @ 7.96 MHz, 85 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R5-J
L26	23642/519	INDUCTOR-FIXED 0.068uH +/- 5% MOULDED-EPOXY, 450mA 0R36 MAX, 27 Q @ 100 MHz, 1K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-068-J
L27 to L31	23642/714	INDUCTOR-FIXED 1.5uH +/- 5% MOULDED-EPOXY, 370mA 0R85 MAX, 30 Q @ 7.96 MHz, 85 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R5-J
L32	23642/517	INDUCTOR-FIXED 0.047uH +/- 5% MOULDED-EPOXY, 450mA 0R3 MAX, 26 Q @ 100 MHz, 1.2K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-047-J
L33	23642/515	INDUCTOR-FIXED 0.033uH +/- 5% MOULDED-EPOXY, 450mA 0R24 MAX, 25 Q @ 100 MHz, 1.4K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-033-J
L34	23642/714	INDUCTOR-FIXED 1.5uH +/- 5% MOULDED-EPOXY, 370mA 0R85 MAX, 30 Q @ 7.96 MHz, 85 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R5-J
L37	23642/519	INDUCTOR-FIXED 0.068uH +/- 5% MOULDED-EPOXY, 450mA 0R36 MAX, 27 Q @ 100 MHz, 1K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-068-J
L38	23642/517	INDUCTOR-FIXED 0.047uH +/- 5% MOULDED-EPOXY, 450mA 0R3 MAX, 26 Q @ 100 MHz, 1.2K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-047-J
L39	23642/714	INDUCTOR-FIXED 1.5uH +/- 5% MOULDED-EPOXY, 370mA 0R85 MAX, 30 Q @ 7.96 MHz, 85 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R5-J
L40	23642/714	INDUCTOR-FIXED 1.5uH +/- 5% MOULDED-EPOXY, 370mA 0R85 MAX, 30 Q @ 7.96 MHz, 85 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R5-J
L41	23642/511	INDUCTOR-FIXED 0.12uH +/- 20% MOULDED-EPOXY, 450mA 0R22 MAX, 30 Q @ 25.2 MHz, 500 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R12-M
L42	23642/510	INDUCTOR-FIXED 0.1uH +/- 5% MOULDED-EPOXY, 450mA 0R44 MAX, 28 Q @ 100 MHz, 700 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R10-J
L43 to L45	23642/714	INDUCTOR-FIXED 1.5uH +/- 5% MOULDED-EPOXY, 370mA 0R85 MAX, 30 Q @ 7.96 MHz, 85 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R5-J
L46 to L49	23642/701	INDUCTOR-FIXED 2.2uH +/- 5% MOULDED-EPOXY, 320mA 1R MAX, 30 Q @ 7.96 MHz, 75 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-2R2-J
L50	23642/712	INDUCTOR-FIXED 0.082uH +/- 5% MOULDED-EPOXY, 450mA 0R4 MAX, 27 Q @ 100 MHz, 900 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-082-J
L51	23642/713	INDUCTOR-FIXED 0.056uH +/- 5% MOULDED-EPOXY, 450mA 0R33 MAX, 26 Q @ 100 MHz, 1.1K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-056-J
L52	23642/715	INDUCTOR-FIXED 0.18uH +/- 20% MOULDED-EPOXY, 450mA 0R28 MAX, 30 Q @ 25.2 MHz, 400 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R18-M
L53	23642/510	INDUCTOR-FIXED 0.1uH +/- 5% MOULDED-EPOXY, 450mA 0R44 MAX, 28 Q @ 100 MHz, 700 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R10-J
L54	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% MOULDED-EPOXY, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M
L55	23642/518	INDUCTOR-FIXED 0.56uH +/- 20% MOULDED-EPOXY, 450mA 0R55 MAX, 30 Q @ 25.2 MHz, 180 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R56-M

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF4	**RF divider (contd.)**			
R1	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R2	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R3	24811/205	RESISTOR-FIXED METAL-FILM 22K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-22K1-1%50ppm
R4	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R5	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R6	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R7	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R8	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R9	24811/148	RESISTOR-FIXED METAL-FILM 90R9 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-90R9-1%50ppm
R10	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R11	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R12	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R13	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R14	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R15	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm
R16	24811/160	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301R-1%50ppm
R17	24811/903	RESISTOR-FIXED METAL-FILM 18R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-18R2-1%
R18	24811/147	RESISTOR-FIXED METAL-FILM 82R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-82R5-1%50ppm
R19	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R20	24811/184	RESISTOR-FIXED METAL-FILM 3K01 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K01-1%50ppm
R21	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R22	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R23	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R24	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R25	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R26	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF4	**RF divider (contd.)**			
R27	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R28	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R29	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R30	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R31	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R32	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R33	24811/132	RESISTOR-FIXED METAL-FILM 20R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-20R-1%-50ppm
R34	24811/130	RESISTOR-FIXED METAL-FILM 16R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-16R2-1%50ppm
R35	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R36	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R37	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R38	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R39	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R40	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R41	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R42	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R43	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R44	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R45	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R46	24811/173	RESISTOR-FIXED METAL-FILM 1K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-1K0-1%-50ppm
R47	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R48	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R49	24811/147	RESISTOR-FIXED METAL-FILM 82R5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-82R5-1%50ppm
R50	24811/160	RESISTOR-FIXED METAL-FILM 301R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-301R-1%50ppm
R51	24811/165	RESISTOR-FIXED METAL-FILM 475R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475R-1%50ppm
R52	24811/161	RESISTOR-FIXED METAL-FILM 332R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-332R-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF4 RF divider (contd.)				
T1	43590/232	WOUND-PART TRANSFORMER, RING-CORE, 6:6 TURNS, TWISTED BIFILAR WOUND, MOUNTED ON 6-PIN TOROID	AMETHYST DESIGNS LTD	AD5313
TR1	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B
TR2	28487/809	TRANSISTOR NPN BIPOLAR BFR93A... 12V 5GHz 250mW 35mA 40hFE MIN @ 30mA, MARKING CODE R2, SURFACE	PHILIPS	BFR93A
TR3	28453/829	TRANSISTOR NPN BIPOLAR BC848B... 30V 200MHz 200mW 100mA 290hFE TYP @ 2mA, NOISE 2dB @ 1KHz, MARKING	PHILIPS	BC848B

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number

AF5 RF output

When ordering, prefix circuit reference with AF5.

	44829-855	Complete unit	Issue 15	
C1 to C4	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C5	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C6	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C7	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C8	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C9	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C10	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
C11	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C12	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C13	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C14	26386/829	CAPACITOR-FIXED CERAMIC 270pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-271-JP
C17	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C18	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C19	26386/971	CAPACITOR-FIXED CERAMIC 2.2pF +/-0.1pF 50V 60 ppm/DEG.C, HIGH-Q, SINGLELAYER, SURFACE-MOUNTED,	AVX LTD	0805-5K-2R2-BAW-TR
C21	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C22	26386/831	CAPACITOR-FIXED CERAMIC 390pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-391-JP
C23	26386/831	CAPACITOR-FIXED CERAMIC 390pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-391-JP
C24	26386/867	CAPACITOR-FIXED CERAMIC 2.2nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-222-KP
C26	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C27	26386/863	CAPACITOR-FIXED CERAMIC 1nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-102-KP
C28	26386/867	CAPACITOR-FIXED CERAMIC 2.2nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-222-KP
C30	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C31	26386/820	CAPACITOR-FIXED CERAMIC 47pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-470-JP
C32	26386/826	CAPACITOR-FIXED CERAMIC 150pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-151-JP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF5 RF output (contd.)				
C33	26386/821	CAPACITOR-FIXED CERAMIC 56pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-560-JP
C34	26386/818	CAPACITOR-FIXED CERAMIC 33pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-330-JP
C35	26386/813	CAPACITOR-FIXED CERAMIC 12pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-120-JP
C36	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C37	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C38	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C39 to C41	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C42 to C46	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C47	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C48	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C49	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C52	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C53	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C54	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C55	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C56	26386/760	CAPACITOR-FIXED CERAMIC 220nF +/-10% 50V X7R MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	PHILIPS	1210-2R-224-K9-BBC
C57	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C58	26386/883	CAPACITOR-FIXED CERAMIC 47nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-473-KP
C59	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C60	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP
C61	26421/112	CAPACITOR-FIXED ALUMINIUM 10uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1V-KA-100-B
C62	26421/141	CAPACITOR-FIXED ALUMINIUM 100uF +/-20% 35V ELECTROLYTIC, RADIAL, 5mm PWP, (TAPED).	PANASONIC INDUSTRIAL	ECE-A-1VU-101B
C63	26386/829	CAPACITOR-FIXED CERAMIC 270pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-271-JP
C64	26386/887	CAPACITOR-FIXED CERAMIC 100nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 1210, NICKEL	ROHM ELECTRONICS LTD	MCH32-5C-104-KP
C65	26386/816	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-220-JP
C66 to C68	26386/875	CAPACITOR-FIXED CERAMIC 10nF +/-10% 50V X7R/2C1, MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5C-103-KP

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF5	**RF output (contd.)**			
C69	26386/816	CAPACITOR-FIXED CERAMIC 22pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-220-JP
C70	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C71	26343/767	CAPACITOR-FIXED CERAMIC 10pF +/-5% 50V NPO MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-100-DP
C73	26386/824	CAPACITOR-FIXED CERAMIC 100pF +/-5% 50V NP0 MULTILAYER, SURFACE-MOUNTED, SIZE 0805, NICKEL	ROHM ELECTRONICS LTD	MCH21-5A-101-JP
D1 to D4	28383/963	DIODE PIN, 1N5719... 250mW 150V 0.3pF AXIAL, HP-OUTLINE-15, (LOOSE).	HEWLETT-PACKARD	1N5719
D5	44529/057	DIODE SMALL-SIGNAL, SCHOTTKY, 5082-2826... SET OF 2, 250mW 15V 1.2pF 1Vf @ 20mA, SPECIAL MATCHED		
D7	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D8	28383/931	DIODE PIN, BAR14-1... DUAL, 140mW 100V 100mA 0.5pF 1.25Vf @ 100mA, IN SERIES, MARKING CODE L7,	SIEMENS LTD	BAR14-1-E6327
D9	28383/931	DIODE PIN, BAR14-1... DUAL, 140mW 100V 100mA 0.5pF 1.25Vf @ 100mA, IN SERIES, MARKING CODE L7,	SIEMENS LTD	BAR14-1-E6327
D10 to D12	28383/962	DIODE PIN, BAR60... TRIPLE, 100V 0.25pF 1.05Vf @ 100mA, T-CIRCUIT, MARKING CODE 60, SURFACE	SIEMENS LTD	BAR60
D13	28335/670	DIODE BAND SWITCHING, BAT18... 35V 100mA 1pF MAX @ 20V, 1.2Vf @ 100mA, MARKING CODE A2, SURFACE	PHILIPS	BAT18/T1
D14	44529/057	DIODE SMALL-SIGNAL, SCHOTTKY, 5082-2826... SET OF 2, 250mW 15V 1.2pF 1Vf @ 20mA, SPECIAL MATCHED		
D16	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D17	28383/903	DIODE SMALL-SIGNAL, BAV99... DUAL, 70V 100mA 1.1Vf @ 50mA, IN SERIES, MARKING CODE A7, SURFACE	PHILIPS	BAV99 (A7)
D18	28371/443	DIODE ZENER, BZX84-C5V6... 350mW 5.6V 5% 250mA MARKING CODE Z3, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V6
D19	28371/443	DIODE ZENER, BZX84-C5V6... 350mW 5.6V 5% 250mA MARKING CODE Z3, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C5V6
D20	28383/930	DIODE SMALL-SIGNAL, BAS16... 330mW 75V 250mA 2pF 1Vf @ 50mA, MARKING CODE A6, SURFACE MOUNTED,	PHILIPS	BAS16
D21	28371/555	DIODE ZENER, BZX84-C6V8... 350mW 6.8V 5% 250mA MARKING CODE Z5, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C6V8
D22	28371/555	DIODE ZENER, BZX84-C6V8... 350mW 6.8V 5% 250mA MARKING CODE Z5, SURFACE MOUNTED, SOT-23, (8mm	PHILIPS	BZX84-C6V8
IC1	28461/461	IC-ANALOGUE MICROWAVE-AMP MSA-0286... 5V 25mA GAIN 12dB @ 1GHz, 3dB BANDWIDTH DC-2.5GHz, BIPOLAR, 4	HEWLETT-PACKARD	MSA-0286-TR1
IC2	28461/801	IC-ANALOGUE MICROWAVE-AMP MSA-1105... 5.5V 60mA GAIN 10.5dB @1GHz, 3dB B/WTH 0.05-1.3GHz, BIPOLAR,	HEWLETT-PACKARD	MSA-1105
IC3	28461/413	IC-ANALOGUE OPERATIONAL AMP TL074... QUAD, JFET INPUT, LOW NOISE, SLEW RATE 8V/uS MIN, GAIN	MOTOROLA INC.	TL074CD
IC4	28461/448	IC-ANALOGUE MICROWAVE-AMP MSA-0386... 5V 35mA GAIN 12dB @ 1GHz, 3dB BANDWIDTH DC-2.4GHz, BIPOLAR, 4	HEWLETT-PACKARD	MSA-0386-TR1

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF5 RF output (contd.)				
IC5	28461/454	IC-ANALOGUE MICROWAVE-AMP MSA-0786... 4V 22mA GAIN 12.5dB @ 1GHz, 3dB BANDWIDTH DC-2GHz, BIPOLAR, 4	HEWLETT-PACKARD	MSA-0786-TR1
IC6	28531/015	RF-MIXER DOUBLE-BALANCED, DIODE RING, RMS-2... 5-1000MHz, 50R 1 dBm RF-1dB COMPRESS, 9.5 dB LOSS,	MINI-CIRCUITS	RMS-2
IC7	28461/450	IC-ANALOGUE MICROWAVE-AMP MSA-0486... 5.25V 50mA GAIN 8dB @ 1GHz, 3dB BANDWIDTH DC-3.2GHz, BIPOLAR,	HEWLETT-PACKARD	MSA-0486-TR1
IC8	28461/450	IC-ANALOGUE MICROWAVE-AMP MSA-0486... 5.25V 50mA GAIN 8dB @ 1GHz, 3dB BANDWIDTH DC-3.2GHz, BIPOLAR,	HEWLETT-PACKARD	MSA-0486-TR1
IC9	28461/801	IC-ANALOGUE MICROWAVE-AMP MSA-1105... 5.5V 60mA GAIN 10.5dB @1GHz, 3dB B/WTH 0.05-1.3GHz, BIPOLAR,	HEWLETT-PACKARD	MSA-1105
IC10	28461/887	IC-ANALOGUE MICROWAVE-AMP MSA-0520... 12V 165mA GAIN 8.5dB @ 1GHz, 3dB BANDWIDTH 100MHz-2.8GHz,	HEWLETT-PACKARD	MSA-0520
IC11	28461/896	IC-ANALOGUE SWITCH DG413... QUAD, 15V SPST, ON-RESISTANCE<35R, 2 x N/O & 2 x N/C @ LOGIC 1,	TEMIC UK LTD	DG413DY
IC12	28461/413	IC-ANALOGUE OPERATIONAL AMP TL074... QUAD, JFET INPUT, LOW NOISE, SLEW RATE 8V/uS MIN, GAIN	MOTOROLA INC.	TL074CD
IC13	28461/388	IC-ANALOGUE OPERATIONAL AMP LM324D... QUAD, GEN-PURPOSE, SLEW RATE 0.2V/uS MIN, GAIN BANDWIDTH	PHILIPS	LM324D
IC14	28467/111	IC-MICRO PERIPHERAL, PCF8574... REMOTE 8-BIT I/O EXPANDER, I.IC BUS, UP TO 8 DEVICE ADDRESS	PHILIPS	PCF8574T
L1 to L5	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L6	23642/514	INDUCTOR-FIXED 0.039uH +/- 5% EPOXY-MOULD, 450mA 0R27 MAX, 25 Q @ 100 MHz, 1.3K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-039-J
L7	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L8	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L9	23642/536	INDUCTOR-FIXED 0.33uH +/- 20% EPOXY-MOULD, 450mA 0R4 MAX, 30 Q @ 25.2 MHz, 300 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R33-M
L10	23642/536	INDUCTOR-FIXED 0.33uH +/- 20% EPOXY-MOULD, 450mA 0R4 MAX, 30 Q @ 25.2 MHz, 300 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-R33-M
L11	23642/519	INDUCTOR-FIXED 0.068uH +/- 5% EPOXY-MOULD, 450mA 0R36 MAX, 27 Q @ 100 MHz, 1K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-068-J
L12	23642/519	INDUCTOR-FIXED 0.068uH +/- 5% EPOXY-MOULD, 450mA 0R36 MAX, 27 Q @ 100 MHz, 1K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-068-J
L13	23642/534	INDUCTOR-FIXED 8.2uH +/- 5% EPOXY-MOULD, 170mA 2R MAX, 30 Q @ 7.96 MHz, 40 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-8R2-J
L14	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L15	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L16	23642/561	INDUCTOR-FIXED 100uH +/- 10% COATED-LACQUER, MINIATURE, 140mA 11R MAX, 50 Q @ 2.5 MHz, 7 MHz	MEGGITT ELECTRONICS	C12-406/8/27471/004
L17	23642/535	INDUCTOR-FIXED 1uH +/- 5% EPOXY-MOULD, 400mA 0R7 MAX, 30 Q @ 7.96 MHz, 120 MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-1R0-J
L19	23642/533	INDUCTOR-FIXED 10uH +/- 5% EPOXY-MOULD, 150mA 2R1 MAX, 30 Q @ 2.52 MHz, 36 MHz SRF, SURFACE MOUNTED,	MEGGITT ELECTRONICS	3612-T-100-J

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF5 RF output (contd.)				
L20	23642/519	INDUCTOR-FIXED 0.068uH +/- 5% EPOXY-MOULD, 450mA 0R36 MAX, 27 Q @ 100 MHz, 1K MHz SRF, SURFACE	MEGGITT ELECTRONICS	3612-T-068-J
R1	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R2	24811/907	RESISTOR-FIXED METAL-FILM 39R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-39R2-1%
R3	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R4 to R6	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R7	24811/159	RESISTOR-FIXED METAL-FILM 274R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-274R-1%50ppm
R8	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R9	24338/003	RESISTOR-FIXED METAL-GLAZE 120R +/- 5% 1W 100V 350 ppm/DEG.C, SURFACE MOUNTED, SIZE 2512, (12mm	VISHAY COMPONENTS	CR2512-120R-5%-P4
R10	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R11	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R12	24811/237	RESISTOR-FIXED METAL-FILM 475K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475K-1%50ppm
R13	24811/237	RESISTOR-FIXED METAL-FILM 475K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-475K-1%50ppm
R16	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R17	24811/213	RESISTOR-FIXED METAL-FILM 47K5 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-47K5-1%50ppm
R18	24811/211	RESISTOR-FIXED METAL-FILM 39K2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-39K2-1%50ppm
R19	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R22	24811/142	RESISTOR-FIXED METAL-FILM 51R1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-51R1-1%50ppm
R23	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R24	24811/907	RESISTOR-FIXED METAL-FILM 39R2 +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-39R2-1%
R25	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R26	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R27	24811/139	RESISTOR-FIXED METAL-FILM 39R2 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-39R2-1%50ppm
R28	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R29	24338/008	RESISTOR-FIXED METAL-GLAZE 330R +/- 5% 1W 100V 350 ppm/DEG.C, SURFACE MOUNTED, SIZE 2512, (12mm	VISHAY COMPONENTS	CR2512-330R-5%-P4

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF5 RF output (contd.)				
R30	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R31	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R32	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R33	24338/003	RESISTOR-FIXED METAL-GLAZE 120R +/- 5% 1W 100V 350 ppm/DEG.C, SURFACE MOUNTED, SIZE 2512, (12mm	VISHAY COMPONENTS	CR2512-120R-5%-P4
R34 to R37	24811/167	RESISTOR-FIXED METAL-FILM 562R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-562R-1%50ppm
R38	24811/180	RESISTOR-FIXED METAL-FILM 2K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-2K0-1%50ppm
R39	24811/171	RESISTOR-FIXED METAL-FILM 825R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-825R-1%50ppm
R40	24811/157	RESISTOR-FIXED METAL-FILM 221R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-221R-1%50ppm
R41	24811/156	RESISTOR-FIXED METAL-FILM 200R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-200R-1%50ppm
R42	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
R43	24811/126	RESISTOR-FIXED METAL-FILM 11R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-11R-1%-50ppm
R44	24338/002	RESISTOR-FIXED METAL-GLAZE 100R +/- 5% 1W 100V 350 ppm/DEG.C, SURFACE MOUNTED, SIZE 2512, (12mm	VISHAY COMPONENTS	CR2512-100R-5%-P4
R45	24338/002	RESISTOR-FIXED METAL-GLAZE 100R +/- 5% 1W 100V 350 ppm/DEG.C, SURFACE MOUNTED, SIZE 2512, (12mm	VISHAY COMPONENTS	CR2512-100R-5%-P4
R46	24573/034	RESISTOR-FIXED METAL-OXIDE 24R +/- 2% 500mW 350V 250 ppm/DEG.C, AXIAL, (LOOSE OR TAPED).	VISHAY COMPONENTS	TR5-24R-2%
R47	24811/912	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-100R-1%
R48	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R49	24811/189	RESISTOR-FIXED METAL-FILM 4K75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-4K75-1%50ppm
R50	24811/911	RESISTOR-FIXED METAL-FILM 75R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED, SIZE	VISHAY COMPONENTS	SMM0204-HF-75R0-1%
R51	24811/261	RESISTOR-FIXED METAL-FILM 4M75 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	WELWYN ELECTRONICS	WRM0204-C-4M75-F-P2
R54	24811/223	RESISTOR-FIXED METAL-FILM 121K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-121K-1%50ppm
R56	24811/236	RESISTOR-FIXED METAL-FILM 432K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-432K-1%50ppm
R58	25748/568	RESISTOR-VARIABLE CERMET LINEAR, 500K 10% 500mW 200V 100 ppm/DEG.C, MULTI-TURN, VERTICAL-PCB,	MEGGITT ELECTRONICS	4290W404/8/06411/504
R60	24811/223	RESISTOR-FIXED METAL-FILM 121K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-121K-1%50ppm
R61	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R62	24811/182	RESISTOR-FIXED METAL-FILM 2K43 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-2K43-1%50ppm
R63	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm

Cir. Ref.	MI part number	Description	Manufacturer	Manufacturer's part number
AF5 RF output (contd.)				
R64	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R65	24811/217	RESISTOR-FIXED METAL-FILM 68K1 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-68K1-1%50ppm
R66	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R67	24811/169	RESISTOR-FIXED METAL-FILM 681R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-681R-1%50ppm
R68	24811/912	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, LOW-INDUCTANCE, SURFACE MOUNTED,	VISHAY COMPONENTS	SMM0204-HF-100R-1%
R69	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R70	24811/185	RESISTOR-FIXED METAL-FILM 3K32 +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-3K32-1%50ppm
R71	24811/197	RESISTOR-FIXED METAL-FILM 10K +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF, (8mm	VISHAY COMPONENTS	SMM0204-10K-1%50ppm
R72	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R73	24811/149	RESISTOR-FIXED METAL-FILM 100R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-100R-1%50ppm
R74	24811/153	RESISTOR-FIXED METAL-FILM 150R +/- 1% 250mW 200V 50 ppm/DEG.C, SURFACE MOUNTED, SIZE MINI-MELF,	VISHAY COMPONENTS	SMM0204-150R-1%50ppm
SKA	23435/990	CONNECTOR SHORTING, SOCKET, 2 WAY, FOR 0.64mm SQ PINS, 2.54mm PITCH, 9.6mm HIGH, FREE MOUNTING,	BERG ELECTRONICS	65474-001
SKSKB	23435/990	CONNECTOR SHORTING, SOCKET, 2 WAY, FOR 0.64mm SQ PINS, 2.54mm PITCH, 9.6mm HIGH, FREE MOUNTING,	BERG ELECTRONICS	65474-001
TR1	28457/851	TRANSISTOR NPN BIPOLAR BFS17... 15V 1.3GHz 250mW 50mA 20hFE MIN @ 2mA, MARKING CODE E1, SURFACE	PHILIPS	BFS17

Monochrome monitor (proprietary)

When ordering, prefix circuit reference with 'monochrome monitor'.

44991/098 Complete unit - CRT Assembly

Cir. Ref.	MI part number	Description	Manufacturer
C1	250052	CAP, FIXED, ELECT 470uF 16V	MARCON CESEM
C2	250056	CAP, FIXED, ELECT 2200uF 16V	MARCON CESEM
C3	210042	CAP, FIXED, POLYESTER 150nF 63V	THOMSON IRD607
C4	210061	CAP, FIXED, POLYESTER 100nF 63V	THOMSON IRD607
C5	250107	CAP, FIXED, ELECT 100uF 35V	MARCON CESEM
C6	231031	CAP, FIXED, POLYESTER 10nF 63V	THOMSON IRD607
C7	210061	CAP, FIXED, POLYESTER 100nF 63V	THOMSON IRD607
C8	210020	CAP, FIXED, POLYESTER 1nF 63V	THOMSON IRD607
C9	210061	CAP, FIXED, POLYESTER 100nF 63V	THOMSON IRD607
C10	210061	CAP, FIXED, POLYESTER 100nF 63V	THOMSON IRD607
C11	250218	CAP, FIXED, ELECT 10uF 100V	MARCON CESEM
C12	250044	CAP, FIXED, ELECT 47uF 16V	MARCON CESEM
C13	210061	CAP, FIXED, POLYESTER 100nF 63V	THOMSON IRD607
C14	231005	CAP, FIXED, POLYESTER 3nF 63V	THOMSON IRD607
C15	250044	CAP, FIXED, ELECT 47uF 16V	MARCON CESEM
C16	210109	CAP, FIXED, POLYPROP 4n7F 1kV	RIFA 431
C17	220022	CAP, FIXED, POLYPROP 470nF 250V	WIMA MKS4
C18	210061	CAP, FIXED, POLYESTER 100nF 63V	THOMSON IRD607
C19	231031	CAP, FIXED, POLYESTER 10nF 63V	THOMSON IRD607
C20	250096	CAP, FIXED, ELECT 4µ7F 35V	MARCON CESEM
C21	200002	CAP, CERAMIC DISC 10nF 1kV	MURATA DE1510E
C22	250194	CAP, FIXED, ELECT 47uF 63V	MARCON CESEM
C23	250199	CAP, FIXED, ELECT 220uF 63V	MARCON CESEM
C24	250246	CAP, FIXED, ELECT 10uF 160V	MARCON CESEM
C28	210040	CAP, FIXED, POLYESTER 100nF 100V	WIMA MKS2
C29	202047	CAP, FIXED, CERAMIC 39pF 100V 5%	PHILIPS 683
C30	210047	CAP, FIXED, POLYESTER 470nF 63V	THOMSON IRD807
C31	202052	CAP, FIXED, CERAMIC 100pF 100V 5%	PHILIPS 683
C32	210061	CAP, FIXED, POLYESTER 100nF 63V	THOMSON IRD607
C33	210040	CAP, FIXED, POLYESTER 100nF 100V	WIMA MKS2
C35	250054	CAP, FIXED, ELECT 1000uF 16V	MARCON CESEM
C37	200003	CAP, CERAMIC DISC 3n3F 1kV	MURATA DE1510E
C38	250044	CAP, FIXED, ELECT 47uF 16V	MARCON CESEM
C39	210039	CAP, FIXED, POLYESTER 15nF 63V	THOMSON IRD607
C43	231026	CAP, FIXED, POLYESTER 3n3F 63V	THOMSON IRD607
C44	231026	CAP, FIXED, POLYESTER 3n3F 63V	THOMSON IRD607

Monochrome monitor (proprietory) (contd.)

Cir. Ref.	Part number	Description	Manufacturer
Coils and Transformers			
(See components prefixed 'L' and 'T')			
Diodes			
D1	343001	DIODE BAS11	PHILIPS
D2	340019	DIODE, ZENER BZX79C3V9	PHILIPS
D3	343005	DIODE BYV96E	PHILIPS
D4	341003	DIODE IN4148	PHILIPS
D6	343005	DIODE BYV96E	PHILIPS
D7	343005	DIODE BYV96E	PHILIPS
D8	343012	DIODE BY229-600	SGS
D9	343001	DIODE BAS11	PHILIPS
D10	343001	DIODE BAS11	PHILIPS
D11	340006	DIODE ZENER BZX79C8V2	PHILIPS
Fuses			
FS		FUSE 2A(T)	Farnell 150-990
Integrated Circuits			
IC1	326003	TDA1170N	SGS
IC2	326006	TDA1180P	SGS
Coils and Transformers			
(See also components prefixed 'T')			
L1	893048	WIDTH COIL	ABA
Transistors			
Q3	376000	TRANSISTOR FET IRF840FI	SGS
Q4	362002	TRANSISTOR NPN BC547B	PHILIPS
Q5	362006	TRANSISTOR NPN BSX59	PHILIPS
Q6	362002	TRANSISTOR NPN BC547B	PHILIPS
Q7	362005	TRANSISTOR NPN BSX20	PHILIPS
Q8	362038	TRANSISTOR NPN BC557B	PHILIPS
Q9	362002	TRANSISTOR NPN BC547B	PHILIPS
Q10	362038	TRANSISTOR NPN BC557B	PHILIPS
Resistors			
(For variable resistors see components prefixed 'VR')			
R9	108391	RESISTOR 390R +/-5% 0.25W	NEOHM CFR25

Monochrome monitor (proprietory) (contd.)

Cir. Ref.	MI part number	Description	Manufacturer
R10	108107	RESISTOR 1R0 +/-5% 0.25W	NEOHM CFR25
R11	108820	RESISTOR 82R +/-5% 0.25W	NEOHM CFR25
R12	108222	RESISTOR 2K2 +/-5% 0.25W	NEOHM CFR25
R13	108154	RESISTOR 150K +/-5% 0.25W	NEOHM CFR25
R14	108337	RESISTOR 3R3 +/-5% 0.25W	NEOHM CFR25
R15	108334	RESISTOR 330K +/-5% 0.25W	NEOHM CFR25
R16	108103	RESISTOR 10K +/-5% 0.25W	NEOHM CFR25
R17	108105	RESISTOR 1M0 +/-5% 0.25W	NEOHM CFR25
R18	108103	RESISTOR 10K +/-5% 0.25W	NEOHM CFR25
R19	108562	RESISTOR 5K6 +/-5% 0.25W	NEOHM CFR25
R20	108473	RESISTOR 47K +/-5% 0.25W	NEOHM CFR25
R24	108562	RESISTOR 5K6 +/-5% 0.25W	NEOHM CFR25
R25	108562	RESISTOR 5K6 +/-5% 0.25W	NEOHM CFR25
R26	108472	RESISTOR 4K7 +/-5% 0.25W	NEOHM CFR25
R27	108223	RESISTOR 22K +/-5% 0.25W	NEOHM CFR25
R28	108331	RESISTOR 330R +/-5% 0.25W	NEOHM CFR25
R29	108101	RESISTOR 100R +/-5% 0.25W	NEOHM CFR25
R30	108224	RESISTOR 220K +/-5% 0.25W	NEOHM CFR25
R31	108101	RESISTOR 100R +/-5% 0.25W	NEOHM CFR25
R32	108330	RESISTOR 33R +/-5% 0.25W	NEOHM CFR25
R33	108104	RESISTOR 100K +/-5% 0.25W	NEOHM CFR25
R36	108471	RESISTOR 470R +/-5% 0.25W	NEOHM CFR25
R37	108104	RESISTOR 100K +/-5% 0.25W	NEOHM CFR25
R38	108563	RESISTOR 56K +/-5% 0.25W	NEOHM CFR25
R39	108102	RESISTOR 1K0 +/-5% 0.25W	NEOHM CFR25
R40	108102	RESISTOR 1K0 +/-5% 0.25W	NEOHM CFR25
R41	108222	RESISTOR 2K2 +/-5% 0.25W	NEOHM CFR25
R42	108120	RESISTOR 12R +/-5% 0.25W	NEOHM CFR25
R43	108151	RESISTOR 150R +/-5% 0.25W	NEOHM CFR25
R44	118005	RESISTOR 820R +/-5% 0.25W	PHILIPS PR37
R45	108683	RESISTOR 68K +/-5% 0.25W	NEOHM CFR25
R47	108101	RESISTOR 100R +/-5% 0.25W	NEOHM CFR25
R48	108104	RESISTOR 100K +/-5% 0.25W	NEOHM CFR25
R49	108472	RESISTOR 4K7 +/-5% 0.25W	NEOHM CFR25
R50	108102	RESISTOR 1K0 +/-5% 0.25W	NEOHM CFR25
R51	108102	RESISTOR 1K0 +/-5% 0.25W	NEOHM CFR25
R52	108180	RESISTOR 18R +/-5% 0.25W	NEOHM CFR25
R53	108563	RESISTOR 56K +/-5% 0.25W	NEOHM CFR25
R54	108223	RESISTOR 22K +/-5% 0.25W	NEOHM CFR25
R55	108823	RESISTOR 82K +/-5% 0.25W	NEOHM CFR25
R56	108104	RESISTOR 100K +/-5% 0.25W	NEOHM CFR25
R57	108682	RESISTOR 6K8 +/-5% 0.25W	NEOHM CFR25
R58	108122	RESISTOR 1K2 +/-5% 0.25W	NEOHM CFR25
R60	108562	RESISTOR 5K6 +/-5% 0.25W	NEOHM CFR25
R62	108562	RESISTOR 5K6 +/-5% 0.25W	NEOHM CFR25
R63	108273	RESISTOR 27K +/-5% 0.25W	NEOHM CFR25

Monochrome monitor (proprietory) (contd.)

Cir. Ref.	Part number	Description	Manufacturer
R64	108101	RESISTOR 100R +/-5% 0.25W	NEOHM CFR25
R65	108561	RESISTOR 560R +/-5% 0.25W	NEOHM CFR25
R66	108105	RESISTOR 1M0 +/-5% 0.25W	NEOHM CFR25
R67	108560	RESISTOR 56R +/-5% 0.25W	NEOHM CFR25
R70	108105	RESISTOR 1M0 +/-5% 0.25W	NEOHM CFR25

Transistors

(See components prefixed 'Q').

Transformers and Coils

(See also components prefixed 'L')

T1	605026	LOPT	ELDOR 1082-0781
T2	840001	DYNAMIC FOCUS TRANSFORMER	ABA

Variable Resistors

VR1	150001	POTENTIOMETER 1K0 20% 0.15W CARBON	PIHER PT10VL
VR3	151010	POTENTIOMETER 100K 20% 0.15W CARBON	PIHER PT10VL
VR4	151008	POTENTIOMETER 220K 20% 0.15W CARBON	PIHER PT10VL
VR5	151008	POTENTIOMETER 220K 20% 0.15W CARBON	PIHER PT10VL
VR6	151010	POTENTIOMETER 100K 20% 0.15W CARBON	PIHER PT10VL
VR7	152001	POTENTIOMETER 2M2 20% 0.15W CARBON	PIHER PT15LV 17.5
VR8	150012	POTENTIOMETER 22K 20% 0.15W CARBON	PIHER PT10VL
VR9	150012	POTENTIOMETER 22K 20% 0.15W CARBON	PIHER PT10VL

Cir. Ref.	Part number	Description

Power supply switch mode unit (proprietary)

When ordering, prefix circuit reference with PSU.

	44991/052	Complete unit - Power Supply Switched Mode Unit
	134101	MI/4 AC-DC PCB 2nd ASSY
C1	304105	CAP NON ELEC .6/250V RIFA PME271M`X2'
C2	304004	CAP NON ELEC 0.15/250V RIFA PME271`X'
C3	304001	CAP NON ELEC 2200PF/250V RIFA "Y"
C4	304001	CAP NON ELEC 2200PF/250V RIFA "Y"
C5	304048	CAP NON ELEC 0.1/100V MICRO 370 21104
C6	304024	CAP NON ELEC 1500pF/100V FKP2 WIMA
C7	304028	CAP NON ELEC 2200PF/100V 630 19222 OR 18222
C8	304048	CAP NON ELEC 0.1/100V MICRO 370 21104
C9	304051	CAP NON ELEC .1/250V MMKO BOX
C10	304159	CAP NON ELEC 100PF/1KV MURATA ERIE DE075B101K1KV
C12	304053	CAP NON ELEC 0.22/100 MMKO BOX
C13	304029	CAP NON ELEC 2200PF/250V "Y"
C15	304173	CAP NON ELECT 4n7/100 MULLARD MICRO 370-21472
C62	304053	CAP NON ELEC 0.22/100 MMKO BOX
C63	304051	CAP NON ELEC .1/250V MMKO BOX
C64	304037	CAP NON ELEC .01/100V MICRO 370 21103
C65	304173	CAP NON ELECT 4n7/100 MULLARD MICRO 370-21472
CE1	301183	CAP E/R 470/200 RUBYCON 105 'C (RS106-338)
CE2	301183	CAP E/R 470/200 RUBYCON 105 'C (RS106-338)
CE3	301174	CAP E/R 47/63V 105'C
CE4	301172	CAP ELEC RAD 470/35V 105'C
CE24	301037	CAP E/R 1000/10V HF
CE31	301172	CAP ELEC RAD 470/35V 105'C
D1	315003	DIODE BRIDGE REC KBL08
D2	313139	DIODE FAST REC UF4005 (1A 600V 75ns)
D3	313136	DIODE FAST REC BYT03-400
D4	313032	DIODE FAST REC RGP10J=FR105
D5	313136	DIODE FAST REC BYT03-400
D6	313136	DIODE FAST REC BYT03-400
D8	313032	DIODE FAST REC RGP10J=FR105
D9	314036	DIODE GENERAL 1N4005
D12	314037	DIODE GENERAL 1N4148
D13	314037	DIODE GENERAL 1N4148
D14	312021	DIODE DUAL EPIT BYW51-150=BYV32-150
DZ1	310016	DIODE ZENER BZX55C 24V

Power supply switch mode unit (proprietory) (contd.)

Cir. Ref.	Part number	Description
DZ2	310014	DIODE ZENER BZX55C 16V
DZ3	310014	DIODE ZENER BZX55C 16V
DZ4	310014	DIODE ZENER BZX55C 16V
DZ5	310007	DIODE ZENER BZX55C 5V1
DZ7	310804	PROG. ZENER TL431I (high temp)
DZ23	310022	DIODE ZENER BZX55C 15V
F4	350015	FUSE THERMAL 100^C (FARNELL 149-889)
IC1	390147	INT CIRCUIT IP2844N (ALTERNATIVE=UC244AN)
IC2	390132	INT CIRCUIT CNY17-F2
R1	321056	RESISTOR MET 150K 1% 1/4W
R2	321056	RESISTOR MET 150K 1% 1/4W
R3	321051	RESISTOR MET 56K 1% 1/4W
R4	321051	RESISTOR MET 56K 1% 1/4W
R5	322022	RESISTOR SPEC 100K O.5W
R6	321042	RESISTOR MET 12K 1% 1/4W
R7	321007	RESISTOR MET 27R 1% 1/4W
R8	321035	RESISTOR MET 4K7 1% 1/4W
R9	321030	RESISTOR MET 2K2 1% 1/4W
R12	321025	RESISTOR MET 1K 1% 1/4W
R13	321006	RESISTOR MET 22R 1% 1/4W
R14	321025	RESISTOR MET 1K 1% 1/4W
R15	321004	RESISTOR MET 15R 1% 1/4W
R16	321021	RESISTOR MET 470R 1% 1/4W
R17	321004	RESISTOR MET 15R 1% 1/4W
R21	321025	RESISTOR MET 1K 1% 1/4W
R22	321051	RESISTOR MET 56K 1% 1/4W
R23	321041	RESISTOR MET 10K 1% 1/4W
R26	323031	RESISTOR WIREWOUND 10R 6W
R28	321037	RESISTOR MET 5K6 1% 1/4W
R29	321003	RESISTOR MET 12R 1% 1/4W
R30	322013	RESISTOR SPEC 100R 3/4W
R31	321027	RESISTOR MET 1K5 1% 1/4W
R32	321072	RESISTOR MET 820K 1% 1/4W
R33	321050	RESISTOR MET 47K 1% 1/4W
R34	321037	RESISTOR MET 5K6 1% 1/4W
R129	321002	RESISTOR MET 10R 1% 1/4W
R131	321031	RESISTOR MET 2K7 1% 1/4W
R146	321040	RESISTOR MET 8K2 1% 1/4W
R147	322141	RESISTOR 1K 1W PHILIPS PR01
R150	322145	RESISTOR SPEC 1M2 0.5W (PHILIPS VR25)

Cir. Ref.	Part number	Description
Power supply switch mode unit (proprietory) (contd.)		
RL1	420010	RELAY PED 11-794-135 12V FARNELL 178-780
TH1	324004	THERMISTOR PTC SURGEGARD 220
TH3	324004	THERMISTOR PTC SURGEGARD 220
TR1	317209	TRANSISTOR IRF740
TR2	317209	TRANSISTOR IRF740
TR5	317505	TRANSISTOR BC327
TR8	317511	TRANSISTOR BD137
TR13	317504	TRANSISTOR BC637
DC-DC Converter		
	134103	MI/4 DC-DC PCB 2nd ASSY
C22	304029	CAP NON ELEC 2200PF/250V "Y"
C23	304029	CAP NON ELEC 2200PF/250V "Y"
C25	304037	CAP NON ELEC .01/100V MICRO 370 21103
C29	304034	CAP NON ELEC 4700PF/100V 630 19472 OR 18472
C31	304048	CAP NON ELEC 0.1/100V MICRO 370 21104
C32	304017	CAP NON ELEC 680PF/500V MURATA ERIE DD06B681K
C34	304048	CAP NON ELEC 0.1/100V MICRO 370 21104
C35	304009	CAP NON ELEC 220PF/500V MURATA ERIE DD12RH221J
C37	304048	CAP NON ELEC 0.1/100V MICRO 370 21104
C39	304051	CAP NON ELEC .1/250V MMKO BOX
C40	304051	CAP NON ELEC .1/250V MMKO BOX
C47	304029	CAP NON ELEC 2200PF/250V "Y"
C48	304029	CAP NON ELEC 2200PF/250V "Y"
C50	304017	CAP NON ELEC 680PF/500V MURATA ERIE DD06B681K
C51	304048	CAP NON ELEC 0.1/100V MICRO 370 21104
C52	304017	CAP NON ELEC 680PF/500V MURATA ERIE DD06B681K
C54	304048	CAP NON ELEC 0.1/100V MICRO 370 21104
C55	304051	CAP NON ELEC .1/250V MMKO BOX
CE5	301182	CAP ELEC RAD 3900/40V BHC ALC50
CE7	301182	CAP ELEC RAD 3900/40V BHC ALC50
CE8	301182	CAP ELEC RAD 3900/40V BHC ALC50
CE9	301038	CAP E/R 1000/16V HF
CE10	301038	CAP E/R 1000/16V HF
CE11	301172	CAP ELEC RAD 470/35V 105'C
CE12	301161	CAP E/R 100/16V 105 °C
CE13	301172	CAP ELEC RAD 470/35V 105'C
CE14	301161	CAP E/R 100/16V 105 °C

Cir. Ref.	Part number	Description

Power supply switch mode unit (proprietory) (contd.)

CE15	301174	CAP E/R 47/63V 105'C
CE16	301174	CAP E/R 47/63V 105'C
CE17	301038	CAP E/R 1000/16V HF
CE18	301172	CAP ELEC RAD 470/35V 105'C
CE19	301038	CAP E/R 1000/16V HF
CE20	301172	CAP ELEC RAD 470/35V 105'C
CE21	301184	CAP E/R 100/35V WAYCOM WHT
CE22	301182	CAP ELEC RAD 3900/40V BHC ALC50
CE23	301182	CAP ELEC RAD 3900/40V BHC ALC50
CE25	301157	CAP E/R 10/35V 105 °C
CE26	301161	CAP E/R 100/16V 105 °C
CE27	301161	CAP E/R 100/16V 105 °C
CE28	301174	CAP E/R 47/63V 105'C
D18	313032	DIODE FAST REC RGP10J=FR105
D19	313032	DIODE FAST REC RGP10J=FR105
D20	313032	DIODE FAST REC RGP10J=FR105
D21	313032	DIODE FAST REC RGP10J=FR105
D22	313138	DIODE FAST REC D10SC6M
D23	313032	DIODE FAST REC RGP10J=FR105
D24	313032	DIODE FAST REC RGP10J=FR105
D25	313032	DIODE FAST REC RGP10J=FR105
D26	313032	DIODE FAST REC RGP10J=FR105
D27	314037	DIODE GENERAL 1N4148
D31	313138	DIODE FAST REC D10SC6M
D32	312021	DIODE DUAL EPIT BYW51-150=BYV32-150
D33	313135	DIODE FAST REC HER104
D34	313135	DIODE FAST REC HER104
D35	313135	DIODE FAST REC HER104
D36	313135	DIODE FAST REC HER104
D37	313032	DIODE FAST REC RGP10J=FR105
D38	313032	DIODE FAST REC RGP10J=FR105
D39	313032	DIODE FAST REC RGP10J=FR105
D40	313032	DIODE FAST REC RGP10J=FR105
D41	312021	DIODE DUAL EPIT BYW51-150=BYV32-150
D42	312021	DIODE DUAL EPIT BYW51-150=BYV32-150
DZ8	310014	DIODE ZENER BZX55C 16V
DZ9	310014	DIODE ZENER BZX55C 16V
DZ10	310014	DIODE ZENER BZX55C 16V
DZ20	310014	DIODE ZENER BZX55C 16V
DZ21	310014	DIODE ZENER BZX55C 16V

Cir. Ref.	Part number	Description
Power supply switch mode unit (proprietory) (contd.)		
FAN	382056	FAN PAPST 3414
R35	321027	RESISTOR MET 1K5 1% 1/4W
R36	321025	RESISTOR MET 1K 1% 1/4W
R54	321041	RESISTOR MET 10K 1% 1/4W
R55	321041	RESISTOR MET 10K 1% 1/4W
R56	321005	RESISTOR MET 18R 1% 1/4W
R57	321042	RESISTOR MET 12K 1% 1/4W
R58	321005	RESISTOR MET 18R 1% 1/4W
R60	321008	RESISTOR MET 33R 1% 1/4W
R61	321008	RESISTOR MET 33R 1% 1/4W
R62	321004	RESISTOR MET 15R 1% 1/4W
R63	321007	RESISTOR MET 27R 1% 1/4W
R64	321013	RESISTOR MET 100R 1% 1/4W
R86	321007	RESISTOR MET 27R 1% 1/4W
R88	321013	RESISTOR MET 100R 1% 1/4W
R92	323149	RESISTOR 0R15 2.5W VITREOUS CGS-C3A
R95	321017	RESISTOR MET 220R 1% 1/4W
R96	321045	RESISTOR MET 22K 1% 1/4W
R97	321013	RESISTOR MET 100R 1% 1/4W
R101	323149	RESISTOR 0R15 2.5W VITREOUS CGS-C3A
R104	321021	RESISTOR MET 470R 1% 1/4W
R106	321017	RESISTOR MET 220R 1% 1/4W
R109	322136	RESISTOR 2R2 1W PR01 PHILIPS
R112	321019	RESISTOR MET 330R 1% 1/4W
R126	321041	RESISTOR MET 10K 1% 1/4W
R127	321041	RESISTOR MET 10K 1% 1/4W
R128	321005	RESISTOR MET 18R 1% 1/4W
R130	321005	RESISTOR MET 18R 1% 1/4W
R132	321008	RESISTOR MET 33R 1% 1/4W
R133	321008	RESISTOR MET 33R 1% 1/4W
R134	321017	RESISTOR MET 220R 1% 1/4W
R135	321017	RESISTOR MET 220R 1% 1/4W
R141	321006	RESISTOR MET 22R 1% 1/4W
R148	321007	RESISTOR MET 27R 1% 1/4W
R151	321041	RESISTOR MET 10K 1% 1/4W
SW1	348014	SWITCH MORS 7769ADBx995+U532
SW2	348005	SWITCH SLIDE 120/240V ARCOELECTRIC T22205BAAD
TR9	317502	TRANSISTOR BC337
TR10	317019	TRANSISTOR BD136
TR14	317519	TRANSISTOR SMP40N10

Cir. Ref.	Part number	Description

Power supply switch mode unit (proprietory) (contd.)

TR15	317519	TRANSISTOR SMP40N10
TR19	317202	TRANSISTOR BUZ71=IRFZ20SPD
TR21	317202	TRANSISTOR BUZ71=IRFZ20SPD
TR23	317027	BD138
TR25	317519	TRANSISTOR SMP40N10
TR27	317519	TRANSISTOR SMP40N10
VR1	328007	POT 2K E4A
Controller 1.		
	134105	MI/4 CONTROL 1 PCB 1ST ASSY
C14	304173	CAP NON ELECT 4n7/100 MULLARD MICRO 370-21472
C17	304012	CAP NON ELEC 470PF/100V 630 19471 OR 18471
C18	304028	CAP NON ELEC 2200PF/100V 630 19222 OR 18222
C19	304008	CAP NON ELEC 220PF/100 630 19221 OR 18221
C20	304048	CAP NON ELEC 0.1/100V MICRO 370 21104
C21	304170	CAP NON ELEC 0.22/100 MULLARD 370-21224
C27	304037	CAP NON ELEC .01/100V MICRO 370 21103
C28	304037	CAP NON ELEC .01/100V MICRO 370 21103
C42	304012	CAP NON ELEC 470PF/100V 630 19471 OR 18471
C43	304033	CAP NON ELEC 3900PF/100V 630 19392 OR 18392
C44	304008	CAP NON ELEC 220PF/100 630 19221 OR 18221
C45	304048	CAP NON ELEC 0.1/100V MICRO 370 21104
C46	304170	CAP NON ELEC 0.22/100 MULLARD 370-21224
C53	304028	CAP NON ELEC 2200PF/100V 630 19222 OR 18222
C57	304028	CAP NON ELEC 2200PF/100V 630 19222 OR 18222
C58	304173	CAP NON ELECT 4n7/100 MULLARD MICRO 370-21472
C59	304173	CAP NON ELECT 4n7/100 MULLARD MICRO 370-21472
C60	304048	CAP NON ELEC 0.1/100V MICRO 370 21104
C61	304048	CAP NON ELEC 0.1/100V MICRO 370 21104
CE6	301157	CAP E/R 10/5V 105 °C
CE29	301188	CAP E/R 1/63V WAYCOM WHT
CE30	301188	CAP E/R 1/63V WAYCOM WHT
D16	314037	DIODE GENERAL 1N4148
D17	314037	DIODE GENERAL 1N4148
D29	314037	DIODE GENERAL 1N4148
D30	314037	DIODE GENERAL 1N4148

Cir. Ref.	Part number	Description

Power supply switch mode unit (proprietory) (contd.)

DZ6	310001	DIODE ZENER BZX55C 2V7
DZ11	310804	PROG. ZENER TL431I(high temp)
DZ12	310804	PROG. ZENER TL431I(high temp)
DZ14	310804	PROG. ZENER TL431I(high temp)
DZ22	310804	PROG. ZENER TL431I(high temp)
DZ6	310001	DIODE ZENER BZX55C 2V7
IC3	390145	INT CIRCUIT UC2825
IC4	390132	INT CIRCUIT CNY17-F2
IC5	390132	INT CIRCUIT CNY17-F2
IC7	390145	INT CIRCUIT UC2825
IC8	390132	INT CIRCUIT CNY17-F2
IC9	390132	INT CIRCUIT CNY17-F2
R18	321041	RESISTOR MET 10K 1% 1/4W
R20	321033	RESISTOR MET 3K6 1% 1/4W
R24	321064	RESISTOR MET 560K 1% 1/4W
R25	321036	RESISTOR MET 5K1 1% 1/4W
R27	321026	RESISTOR MET 1K2 1% 1/4W
R37	321032	RESISTOR MET 3K3 1% 1/4W
R38	321037	RESISTOR MET 5K6 1% 1/4W
R39	321030	RESISTOR MET 2K2 1% 1/4W
R40	321025	RESISTOR MET 1K 1% 1/4W
R41	321019	RESISTOR MET 330R 1% 1/4W
R42	321025	RESISTOR MET 1K 1% 1/4W
R43	321086	RESISTOR MET 7K5 1% 1/4W
R44	321025	RESISTOR MET 1K 1% 1/4W
R45	321035	RESISTOR MET 4K7 1% 1/4W
R46	321040	RESISTOR MET 8K2 1% 1/4W
R47	321025	RESISTOR MET 1K 1% 1/4W
R48	321007	RESISTOR MET 27R 1% 1/4W
R49	321035	RESISTOR MET 4K7 1% 1/4W
R50	321032	RESISTOR MET 3K3 1% 1/4W
R51	321004	RESISTOR MET 15R 1% 1/4W
R52	321006	RESISTOR MET 22R 1% 1/4W
R53	321006	RESISTOR MET 22R 1% 1/4W
R66	321021	RESISTOR MET 470R 1% 1/4W
R67	321041	RESISTOR MET 10K 1% 1/4W
R68	321036	RESISTOR MET 5K1 1% 1/4W
R69	321036	RESISTOR MET 5K1 1% 1/4W
R77	321041	RESISTOR MET 10K 1% 1/4W
R78	321026	RESISTOR MET 1K2 1% 1/4W
R79	321037	RESISTOR MET 5K6 1% 1/4W
R80	321036	RESISTOR MET 5K1 1% 1/4W

Cir. Ref.	Part number	Description
Power supply switch mode unit (proprietory) (contd.)		
R81	321044	RESISTOR MET 18K 1% 1/4W
R82	321023	RESISTOR MET 680R 1% 1/4W
R83	321021	RESISTOR MET 470R 1% 1/4W
R84	321030	RESISTOR MET 2K2 1% 1/4W
R85	321041	RESISTOR MET 10K 1% 1/4W
R114	321034	RESISTOR MET 3K9 1% 1/4W
R115	321025	RESISTOR MET 1K 1% 1/4W
R116	321035	RESISTOR MET 4K7 1% 1/4W
R117	321040	RESISTOR MET 8K2 1% 1/4W
R118	321025	RESISTOR MET 1K 1% 1/4W
R119	321035	RESISTOR MET 4K7 1% 1/4W
R120	321007	RESISTOR MET 27R 1% 1/4W
R121	321025	RESISTOR MET 1K 1% 1/4W
R122	321069	RESISTOR MET 6R8 1% 1/4W
R124	321006	RESISTOR MET 22R 1% 1/4W
R125	321006	RESISTOR MET 22R 1% 1/4W
R136	321026	RESISTOR MET 1K2 1% 1/4W
R137	321054	RESISTOR MET 100K 1% 1/4W
R138	321047	RESISTOR MET 33K 1% 1/4W
R139	321034	RESISTOR MET 3K9 1% 1/4W
R142	321021	RESISTOR MET 470R 1% 1/4W
R143	321023	RESISTOR MET 680R 1% 1/4W
R144	321021	RESISTOR MET 470R 1% 1/4W
R145	321025	RESISTOR MET 1K 1% 1/4W
SCR1	317025	THYRISTOR 2N5060
TH2	324001	THERMISTOR PTC 80 DEG. C SWITCHING (E220ZZ/03)
TR3	317502	TRANSISTOR BC337
TR11	317505	TRANSISTOR BC327
TR12	317502	TRANSISTOR BC337
TR18	317502	TRANSISTOR BC337
TR24	317502	TRANSISTOR BC337
TR29	317502	TRANSISTOR BC337

Cir. Ref.	Part number	Description

Power supply switch mode unit (proprietory) (contd.)

Controller 2		
	134107	MI/4 CONTROL 2 PCB 1ST ASSY
C30	304012	CAP NON ELEC 470PF/100V 630 19471 OR 18471
C33	304012	CAP NON ELEC 470PF/100V 630 19471 OR 18471
C36	304012	CAP NON ELEC 470PF/100V 630 19471 OR 18471
DZ15	310804	PROG. ZENER TL431I (high temp)
DZ16	310012	DIODE ZENER BZX55C 12V
DZ17	310804	PROG. ZENER TL431I (high temp)
DZ18	310012	DIODE ZENER BZX55C 12V
DZ19	310025	DIODE ZENER BZX55C 33V
IC6	390009	INT CIRCUIT 723C
L1	134500	MI4 AC INPUT COMMON MODE CHOKE (AC PCB)
L2	134501	MI4 AC INPUT LINE CHOKE (AC PCB)
L3	134501	MI4 AC INPUT LINE CHOKE (AC PCB)
L5	134504	MI4 AC-DC OUTPUT CHOKE (AC PCB)
L6	134505	MI4 DC-DC CONVERTER 1 OUTPUT CHOKE DC PCB)
L7	134506	MI4 +5V OUTPUT FILTER CHOKE (DC PCB)
L8	134507	MI4 DC-DC CONVERTER 1 OUTPUT FILTER CHOKE (DC PCB)
L9	134508	MI4 DC-DC CONVERTER 2 OUTPUT CHOKE (DC PCB)
L10	134509	MI4 DC-DC CONVERTER 2 OUTPUT FILTER CHOKE (DC PCB)
L11	134509	MI4 DC-DC CONVERTER 2 OUTPUT FILTER CHOKE (DC PCB)
L12	134511	MI4 DC INPUT LINE CHOKE AC PCB)
L14	134512	MI4 DC COMMON MODE CHOKE (AC PCB)
R87	321041	RESISTOR MET 10K 1% 1/4W
R89	321025	RESISTOR MET 1K 1% 1/4W
R90	321031	RESISTOR MET 2K7 1% 1/4W
R91	321016	RESISTOR MET 180R 1% 1/4W
R93	321036	RESISTOR MET 5K1 1% 1/4W
R94	321036	RESISTOR MET 5K1 1% 1/4W
R98	321030	RESISTOR MET 2K2 1% 1/4W
R99	321037	RESISTOR MET 5K6 1% 1/4W
R100	321016	RESISTOR MET 180R 1% 1/4W
R102	321101	RESISTOR MET 13K 1% 1/4W
R103	321033	RESISTOR MET 3K6 1% 1/4W
R105	321025	RESISTOR MET 1K 1% 1/4W
R107	321057	RESISTOR MET 180K 1% 1/4W

Cir. Ref.	Part number	Description

Power supply switch mode unit (proprietory) (contd.)

R108	321030	RESISTOR MET 2K2 1% 1/4W
R110	321102	RESISTOR MET 16K 1% 1/4W
R111	321035	RESISTOR MET 4K7 1% 1/4W
T1	134400	MI4 AC-DC MAIN TRANSFORMER (AC PCB)
T2	134401	MI4 AC-DC PRIMARY CURRENT TRANSFORMER (AC PCB)
T3	299400	STANDARD TX. 75 TURNS 0F 0.28MM 0N P/N 375005 (DC PCB)
T4	134403	MI4 DC-DC CONVERTER 1 MAIN TRANSFORMER (DC PCB)
T5	299400	STANDARD TX. 75 TURNS 0F 0.28MM 0N P/N 375005 (DC PCB)
T6	299400	STANDARD TX. 75 TURNS 0F 0.28MM 0N P/N 375005 DC PCB)
T7	134406	MI4 DC-DC CONVERTER 2 MAIN TRANSFORMER) (DC PCB)
T8	134407	MI4 SYNC. TRANSFORMER (CONT.1 PCB)
TR20	317502	TRANSISTOR BC337
TR22	317502	TRANSISTOR BC337

Cir. Ref.	Part number	Description

Common parts

44991-086 Complete unit Issue 062

Programmed ICs

Part no.	Description	Issue
44533/402	EPROM, AE1 Control	002
44533/405	EPROM, A1 CPU	003
44533/406	PROM, non-erasable, A5 LCA code	002
44533/407	EPROM, A5 CPU	004
44533/408	IC-PROGRAMMED EPROM,	007 (5.4 SW only)
44533/409	EPROM, A7 key decoder	001

Miscellaneous mechanical parts

Item numbers are as show in Fig. 6-1. Omit item number when ordering.

Item no.	Description	Part No.
1	Top cover	35907/112
2	Loudspeaker, round	23646/110
3	Rear foot (4 off)	37591/590
4	Battery holder	23711/198
-	Battery, 3.5 V Lithium	23711/106
5	Attenuator Assy	44991/102
-	Attenuator SA	44429/072
-	Attenuator SG	44429/073
6	Handle Assy	41590/282
7	Lower cover	35907/111
8	Knob, large	37591/397
-	Knob collet	37591/452
-	Collet retaining screw	21262/702
9	Knob, small (4 off)	37591/610
-	Knob retaining screw (2 off per knob)	21815/354
10	Keyboard	46662/446
11	1 GHz input switch	44991/180
12	3 GHz power sensor	44991/024

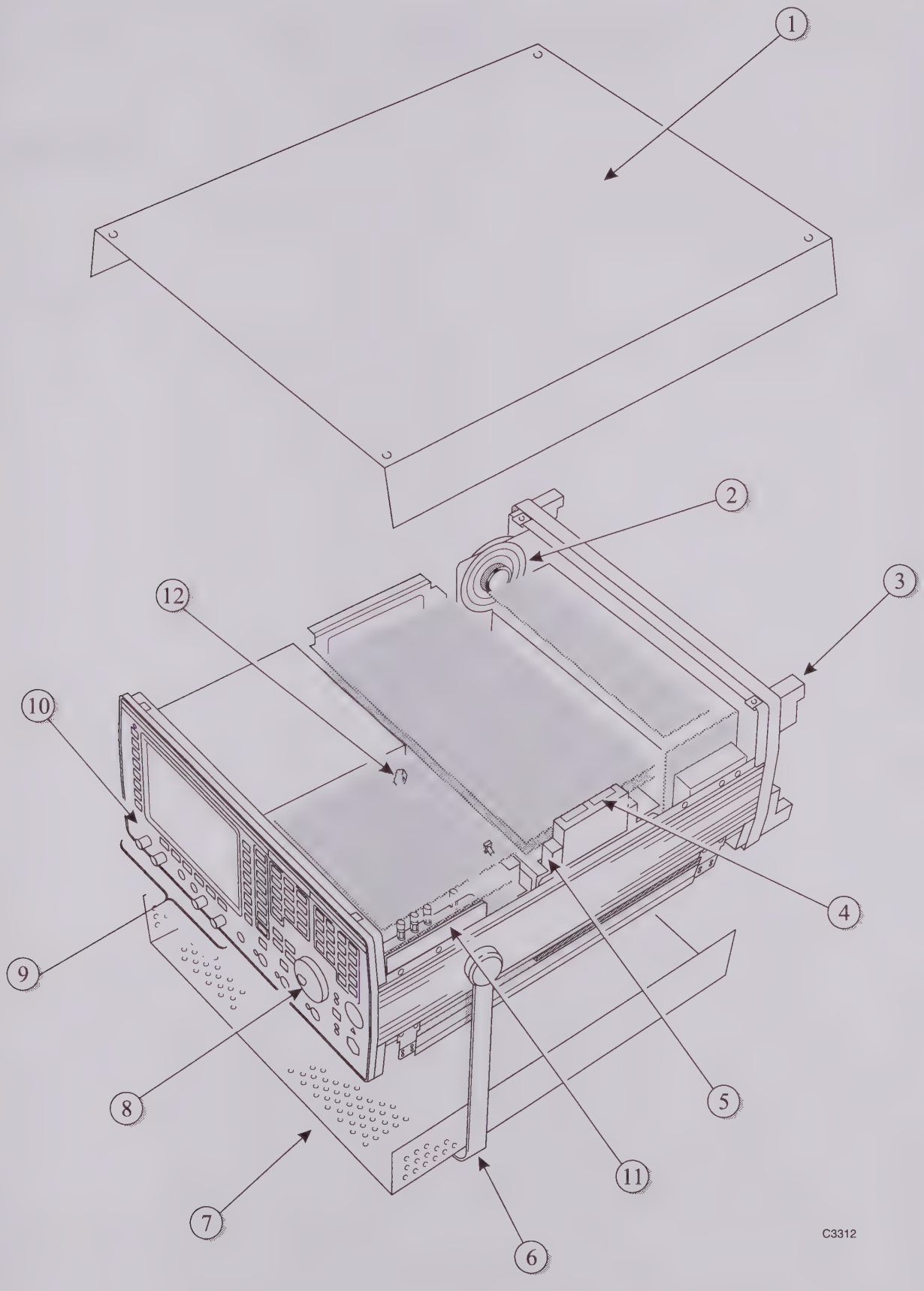

Fig. 6-1 Miscellaneous mechanical parts

Chapter 7
SERVICING DIAGRAMS

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Circuit notes

Component values

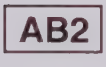
Resistors :	R	= ohms,	k	= kilohms,	M = megohms.
Capacitor:	µ	= microfarads,	n	= nanofarads,	p = picofarads.
Inductors :	µ	= microhenries,	m	= millihenries.	
SIC :		= value selected during test, nominal value shown.			

Symbols

Symbols are to IEC617 (BS 3939) with the following additions :

Static sensitive component

Test point



Unit identification

RF tray - interconnections **AE**

2965A/66A Block diagram - Part 1

2965A/66A Block diagram - Part 2

RF tray - interconnections **AE**

Interconnections **A1, A5**

Interconnections **A6, A7, AB2, AA1**

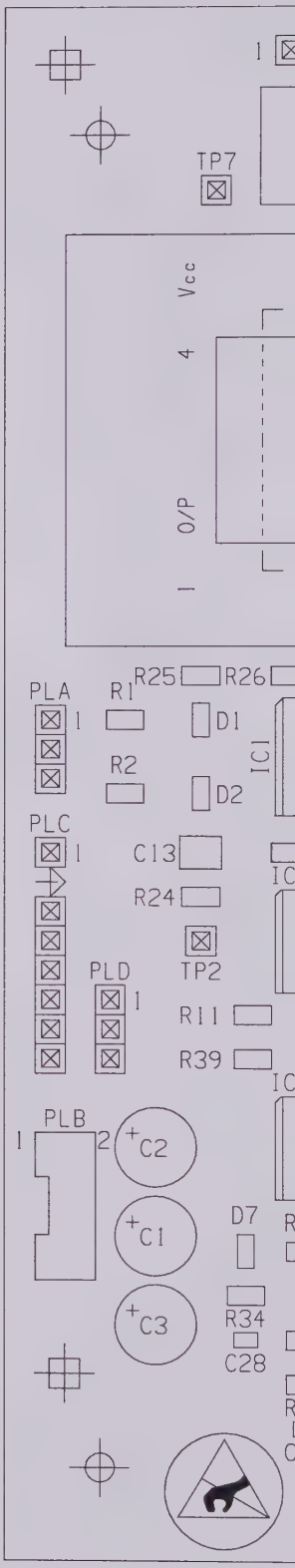
Interconnections **A2, A3**

Interconnections **A1, A5**

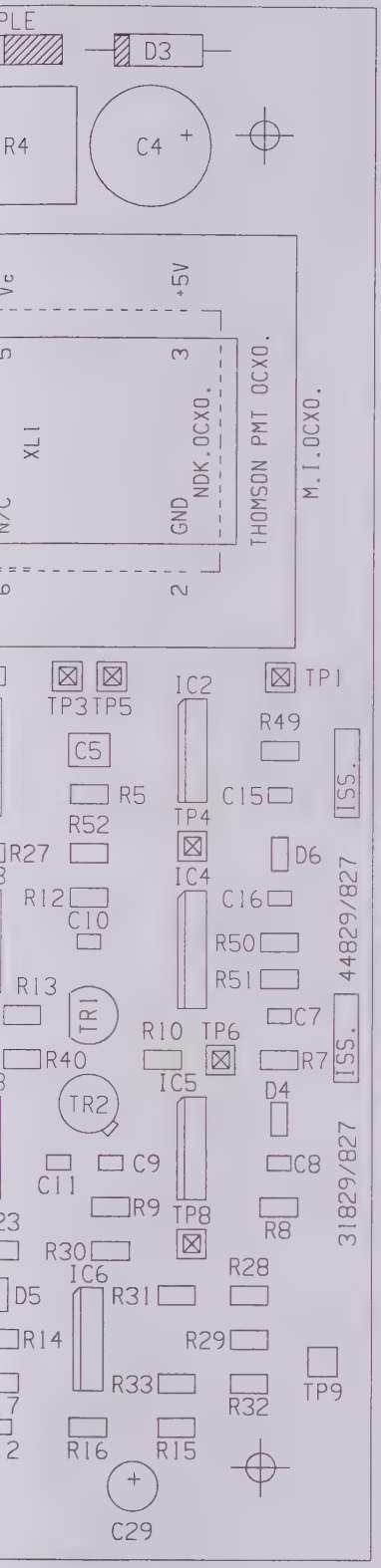
Interconnections **AR1, AR2**

Front panel: - interconnections

Rear panel: - interconnections



Interconnections A4, A8, AB3



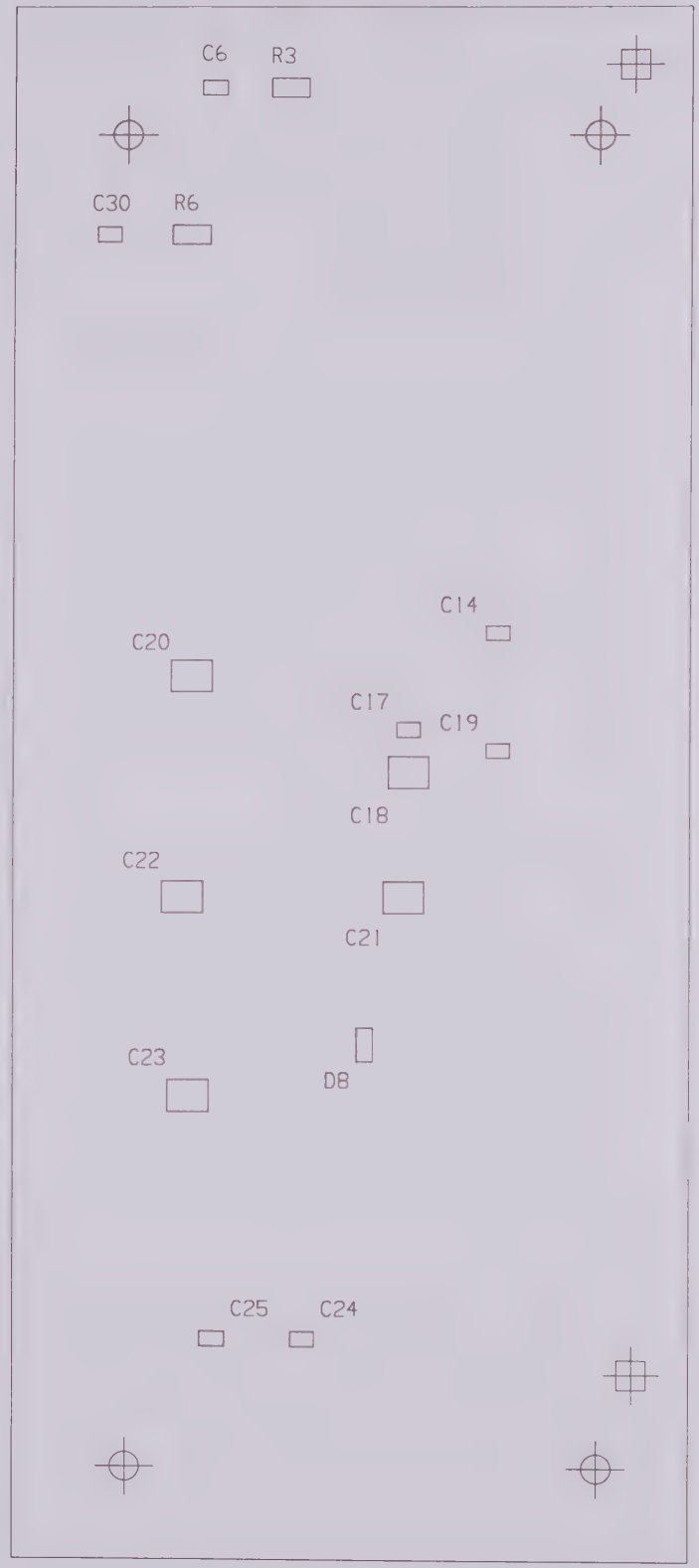


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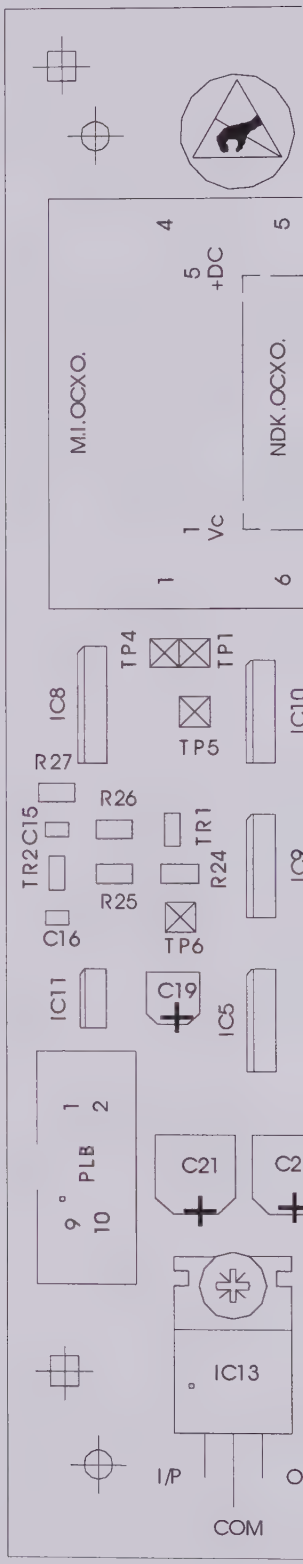
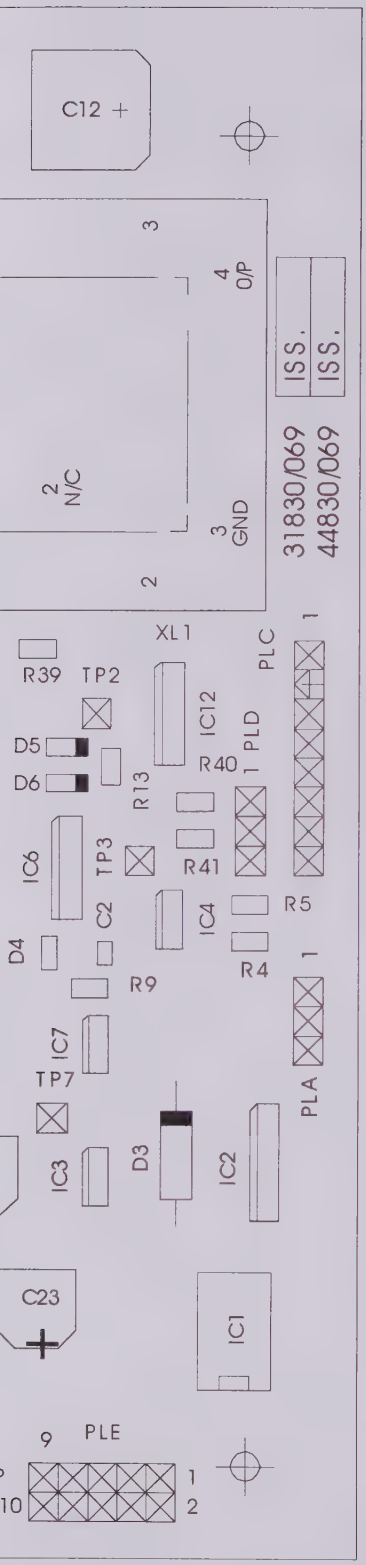
Fig. 7-10 AR1 10 MHz OCXO - component layout



10 MHz OCXO AR1



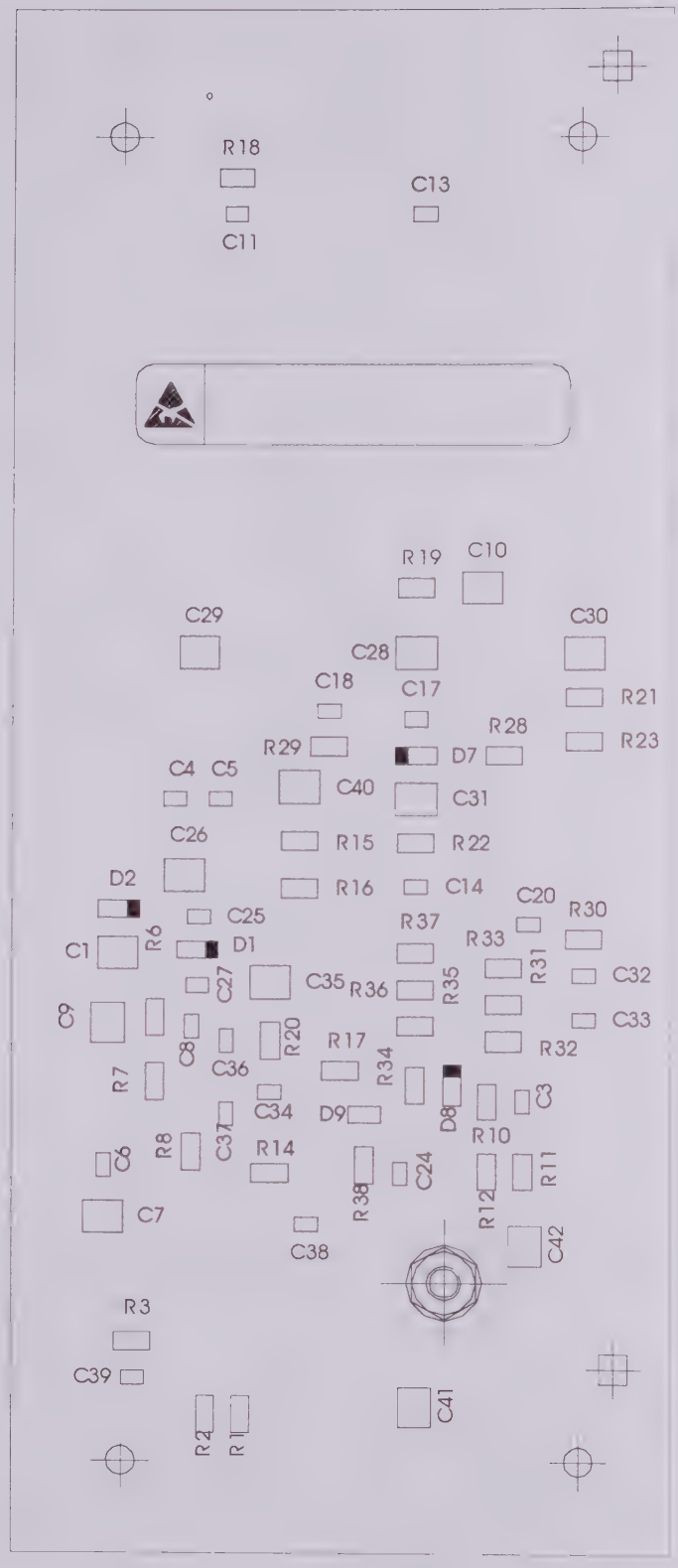


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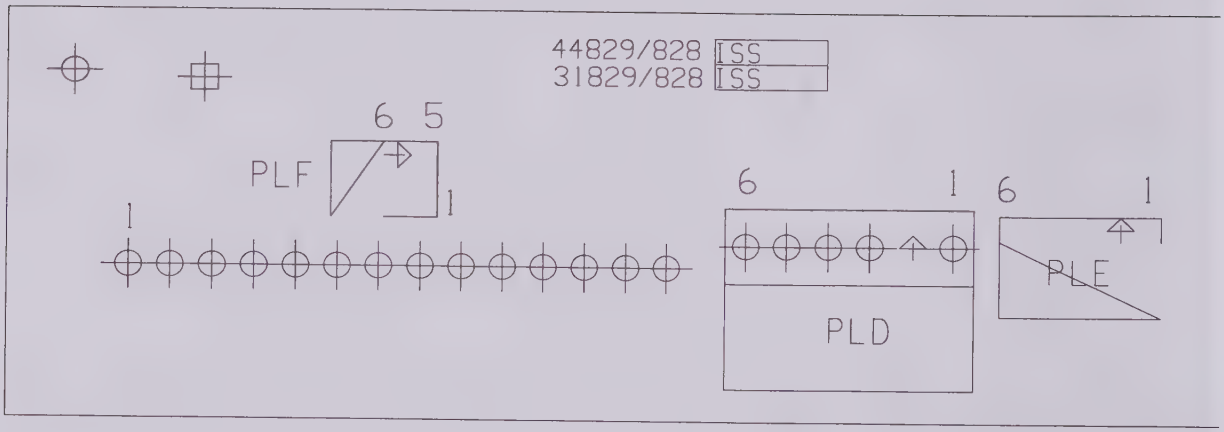
Fig. 7-12 AR1/2 10 MHz OCXO - component layout



10 MHz OCXO **AR1/2**

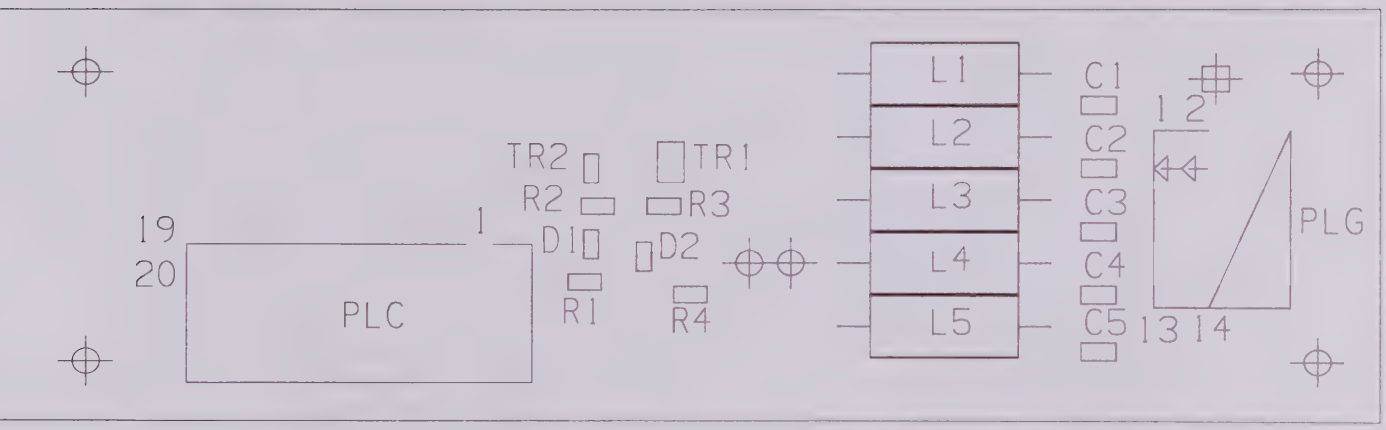


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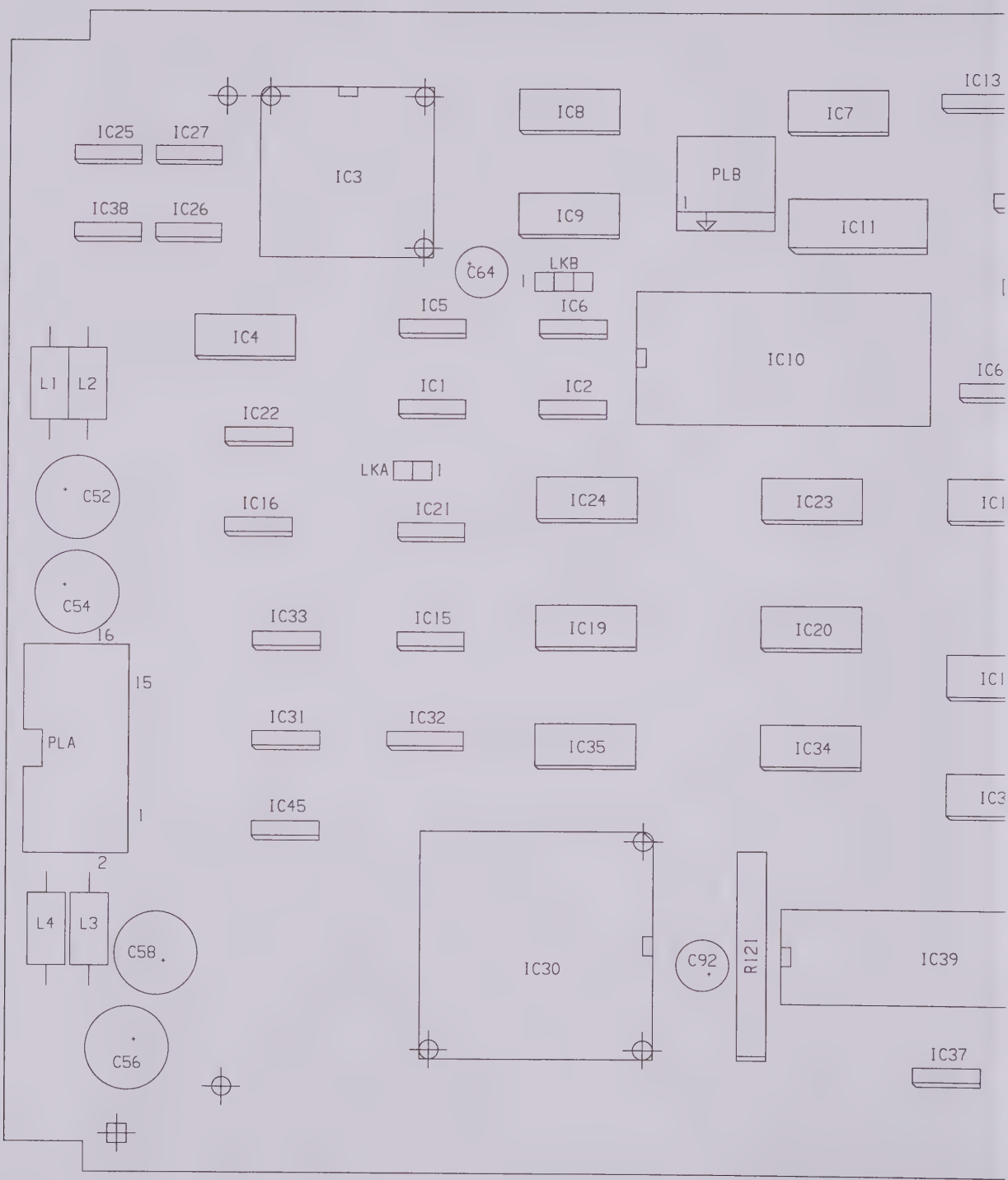
Fig. 7-14 AR2 PSU distribution - component layout



PSU distribution **AR2**

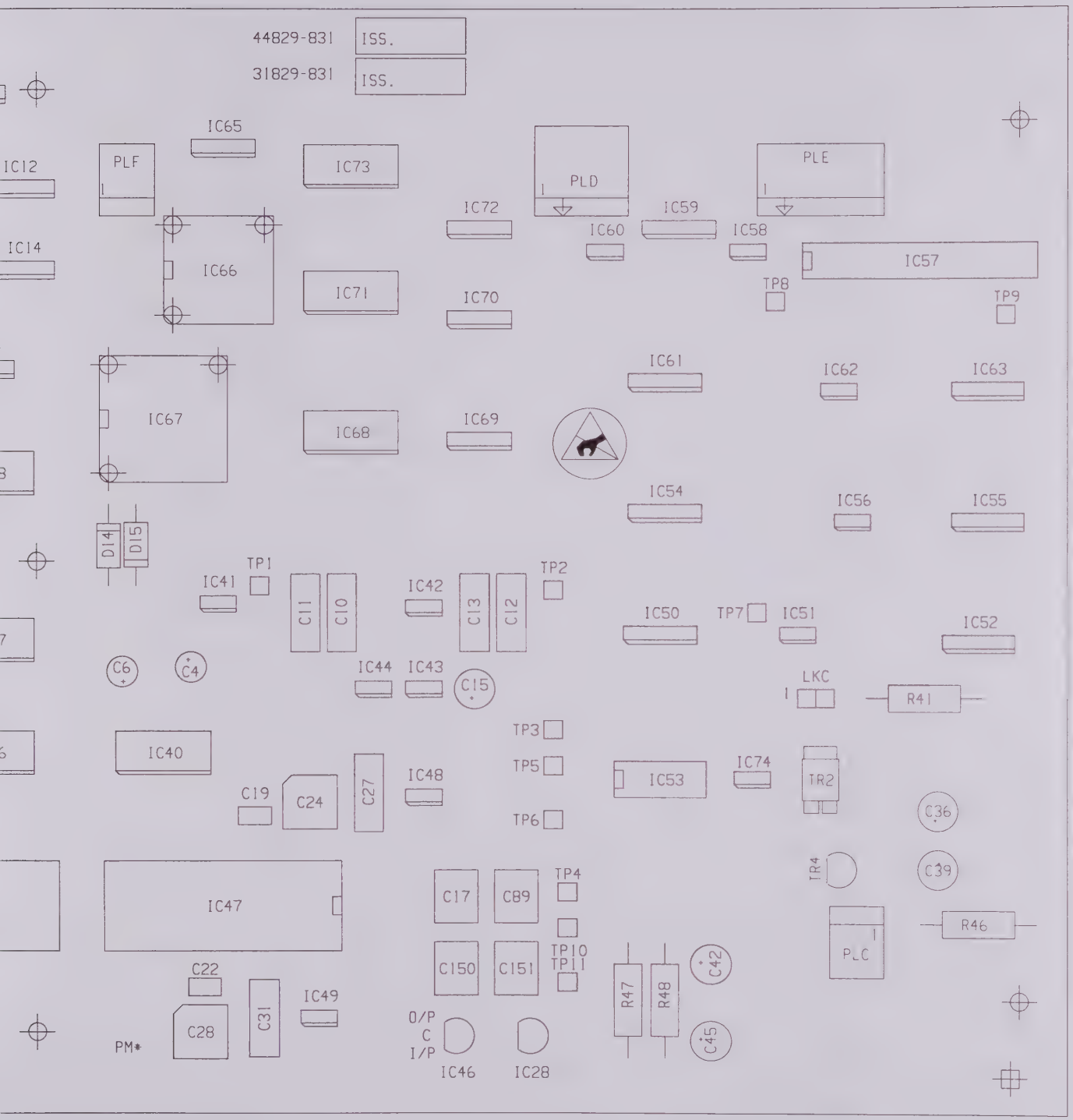


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Fig. 7-16 A1 Audio generator - component layout, component side

Component layout **A1**

DACs and analogue filters A1

Bridge and boot addressing A1

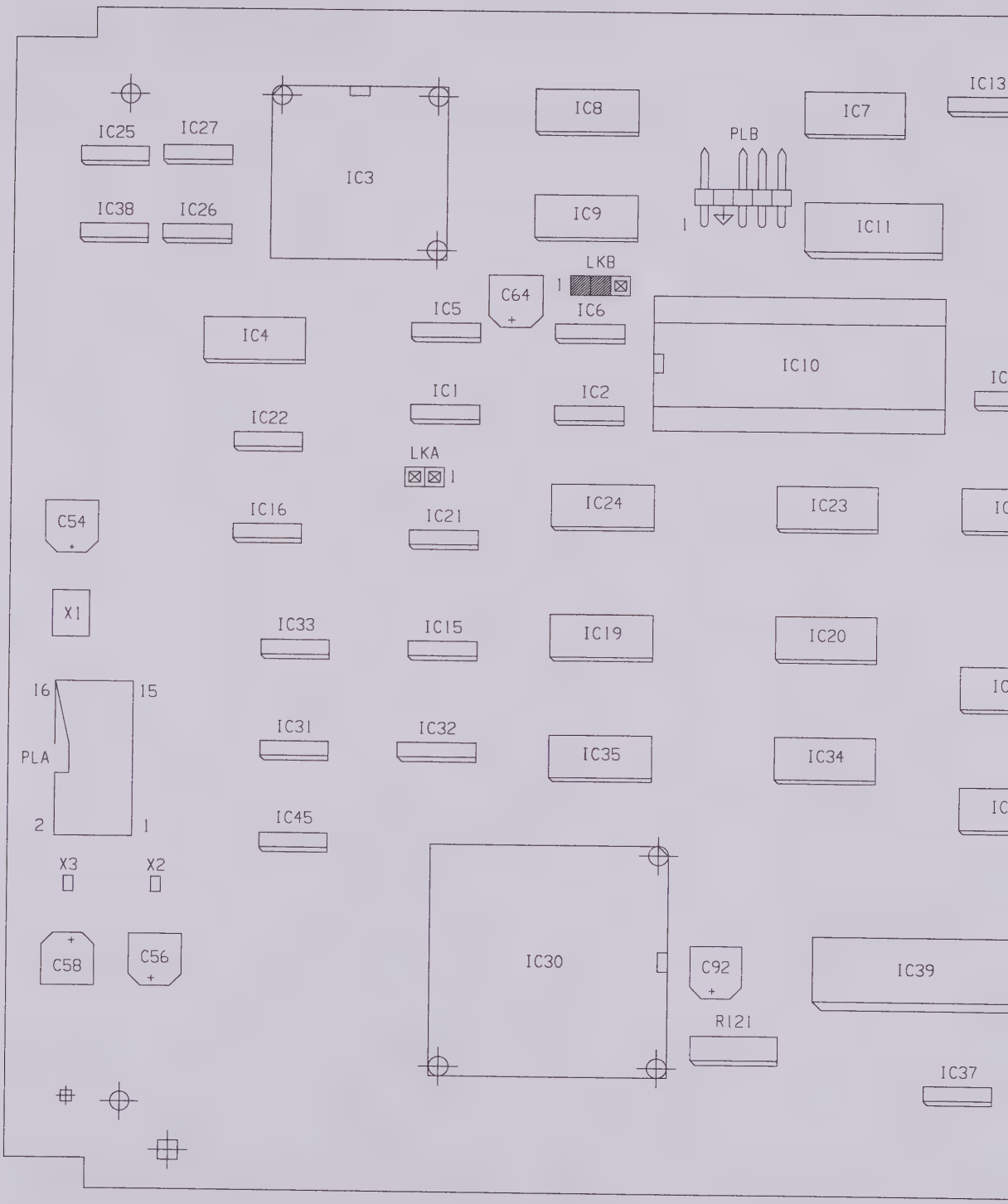
DSP, dividers, and oversampling **A1**

DACs and analogue filters A1

Audio output path **A1**

Modulation and calibration paths **A1**

Audio counter and switch control **A1**



Power supplies **A1**

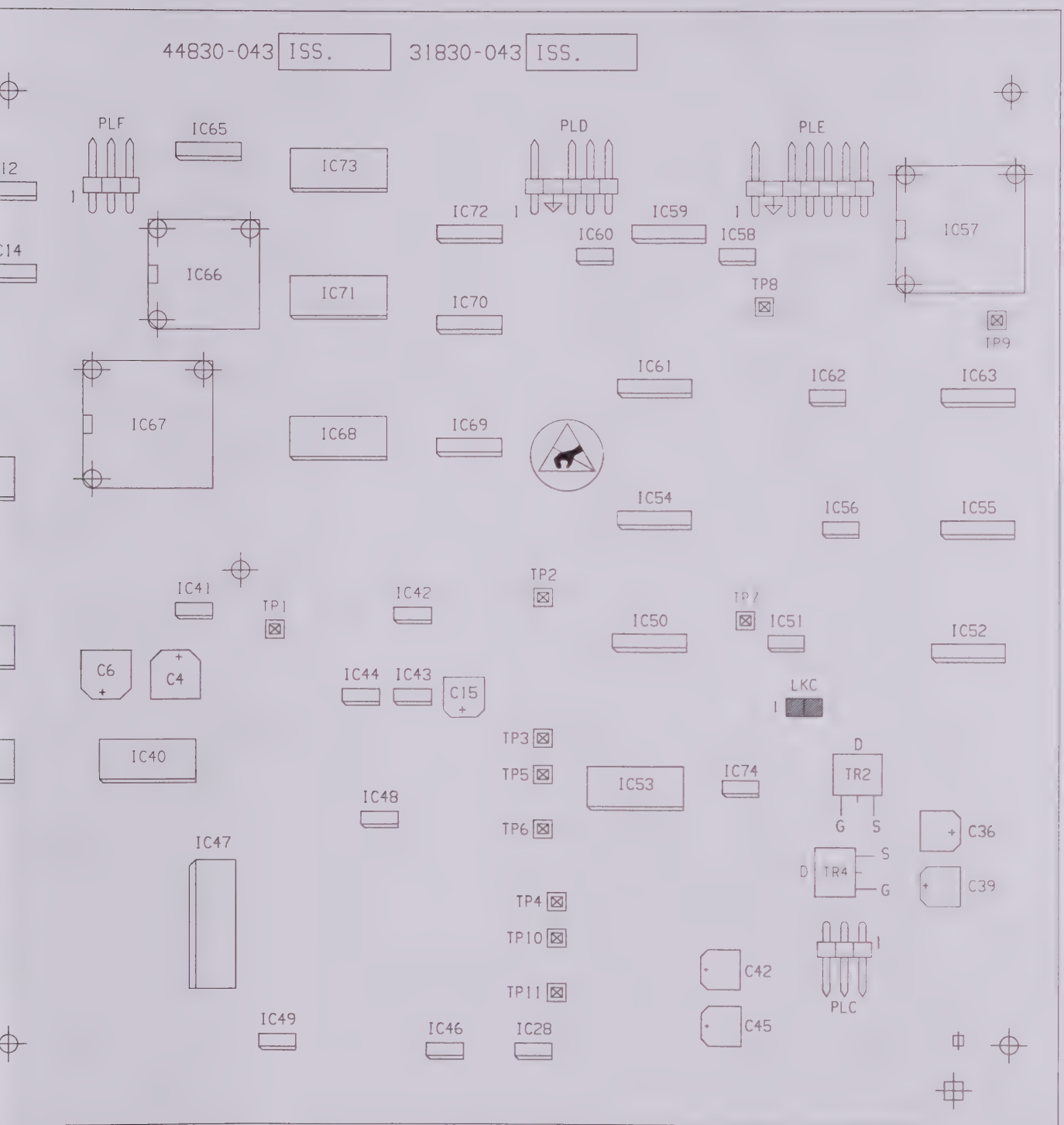


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Fig. 7-26 A1/2 Audio generator - component layout, component side

Component layout **A1/2**

Microprocessor memory and addressing **A1/2**

Bridge and boot addressing **A1/2**

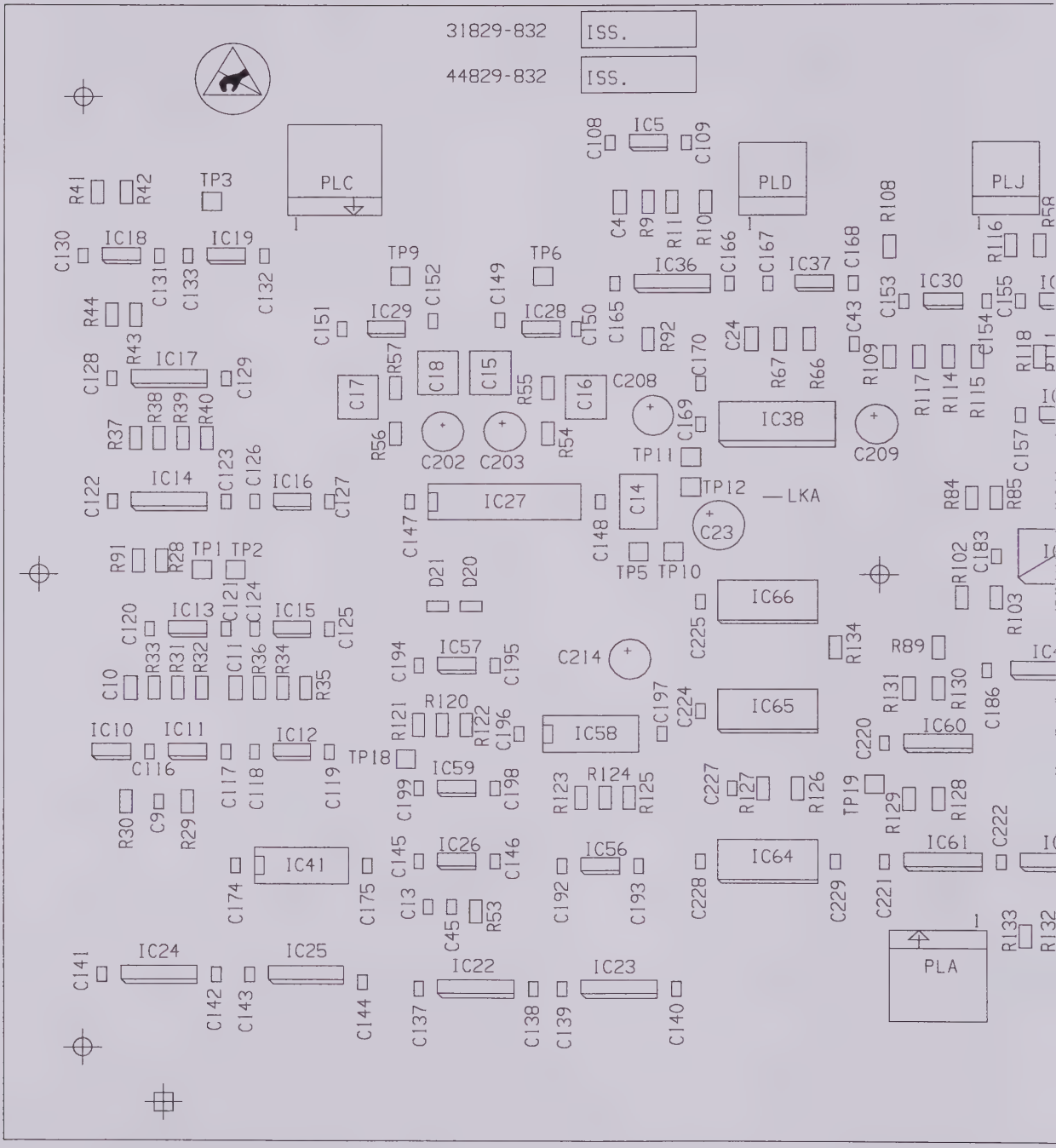
DSP, dividers, and oversampling **A1/2**

Audio counter and switch control **A1/2**

Audio output path A1/2

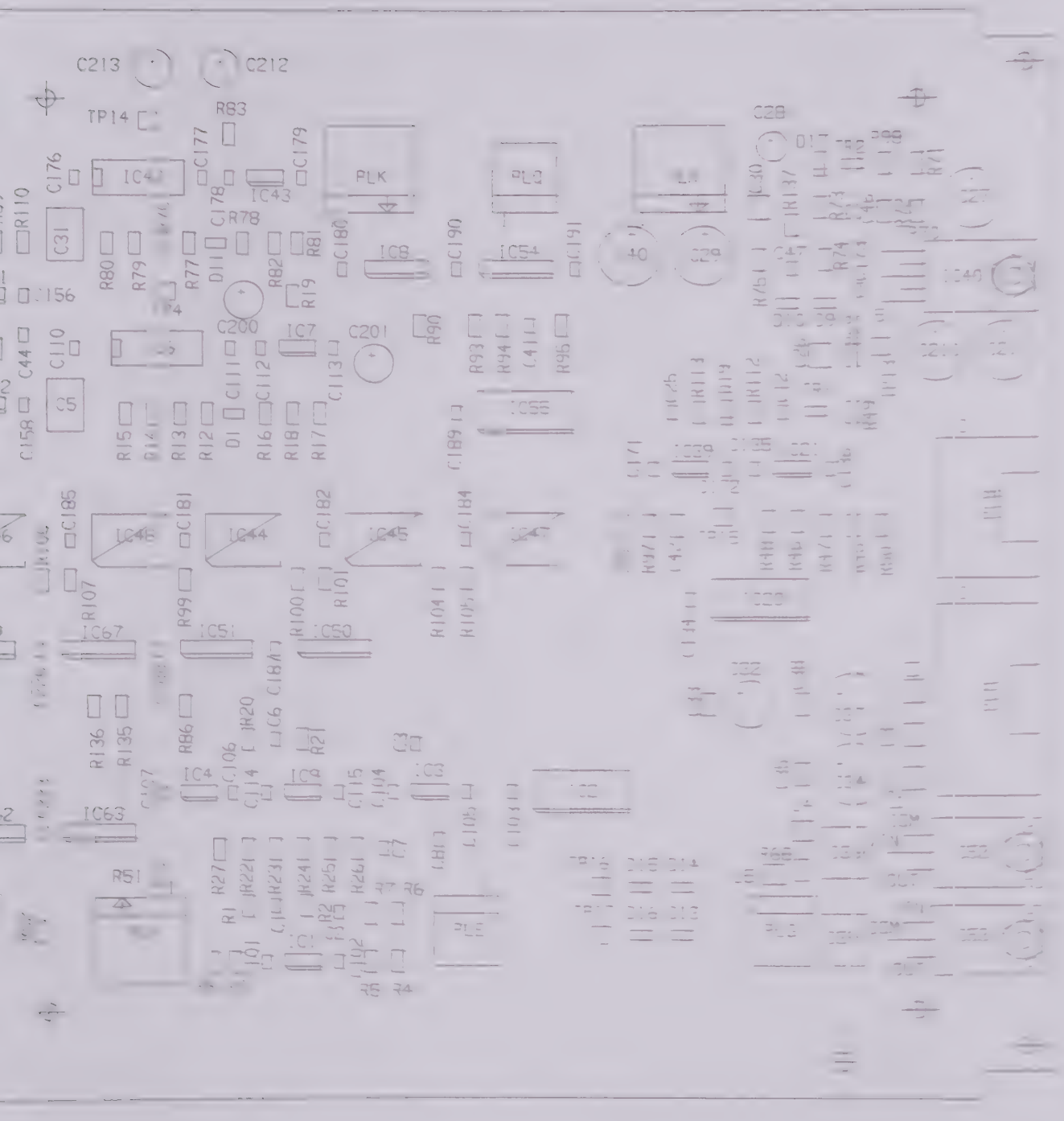
Modulation and calibration paths A1/2

Audio counter and switch control **A1/2**



Power supplies **A1/2**

Component layout A2



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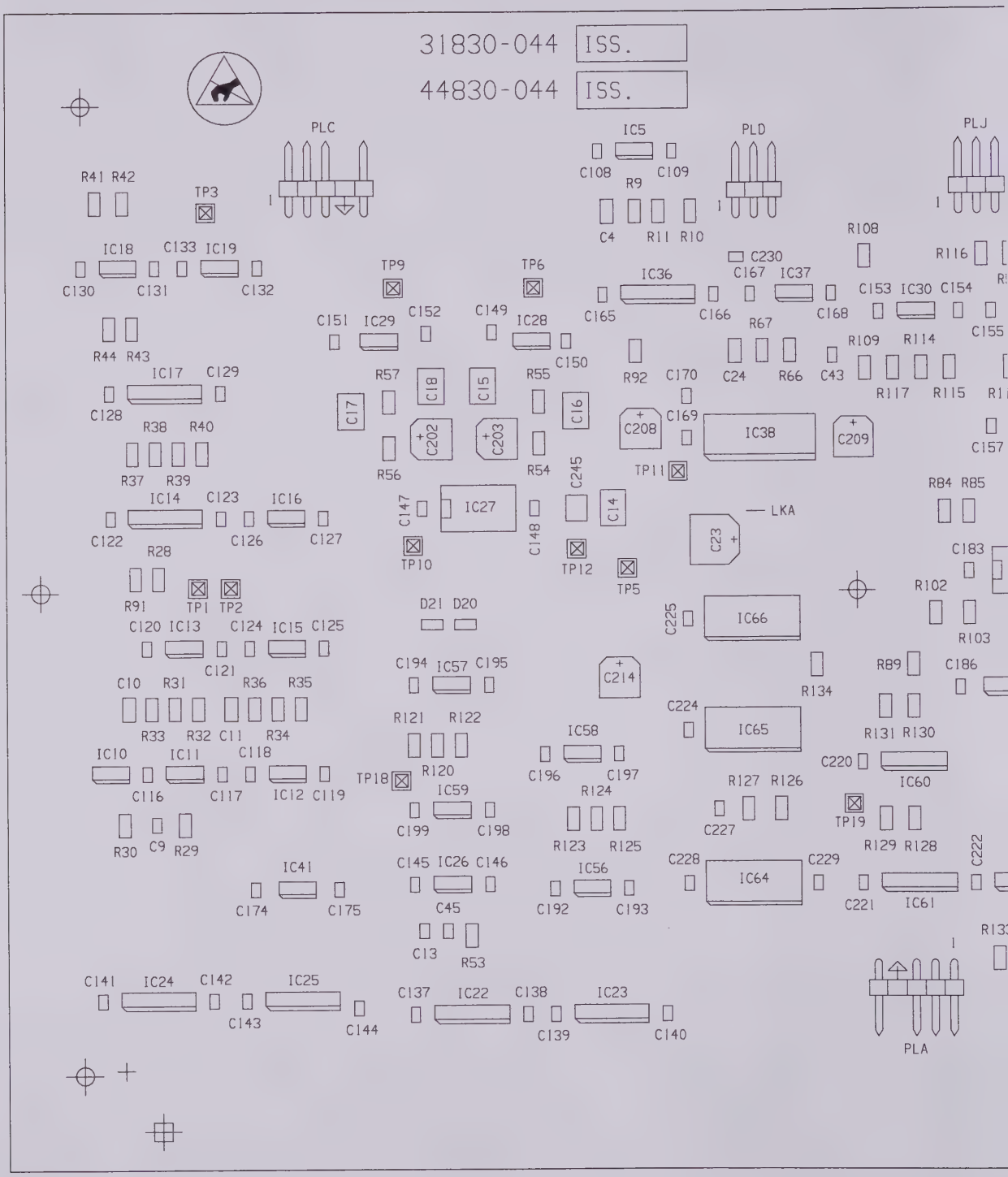
Vertical shift, ext mod scaling, calibration ref gen **A2**

Signal selection, RMS to DC converter, and ADC **A2**

Squelch control, loudspeaker, and audio count channels **A2**

Signal selection, RMS to DC converter and ADC **A2/2**



I²C interface, supply regulators A2

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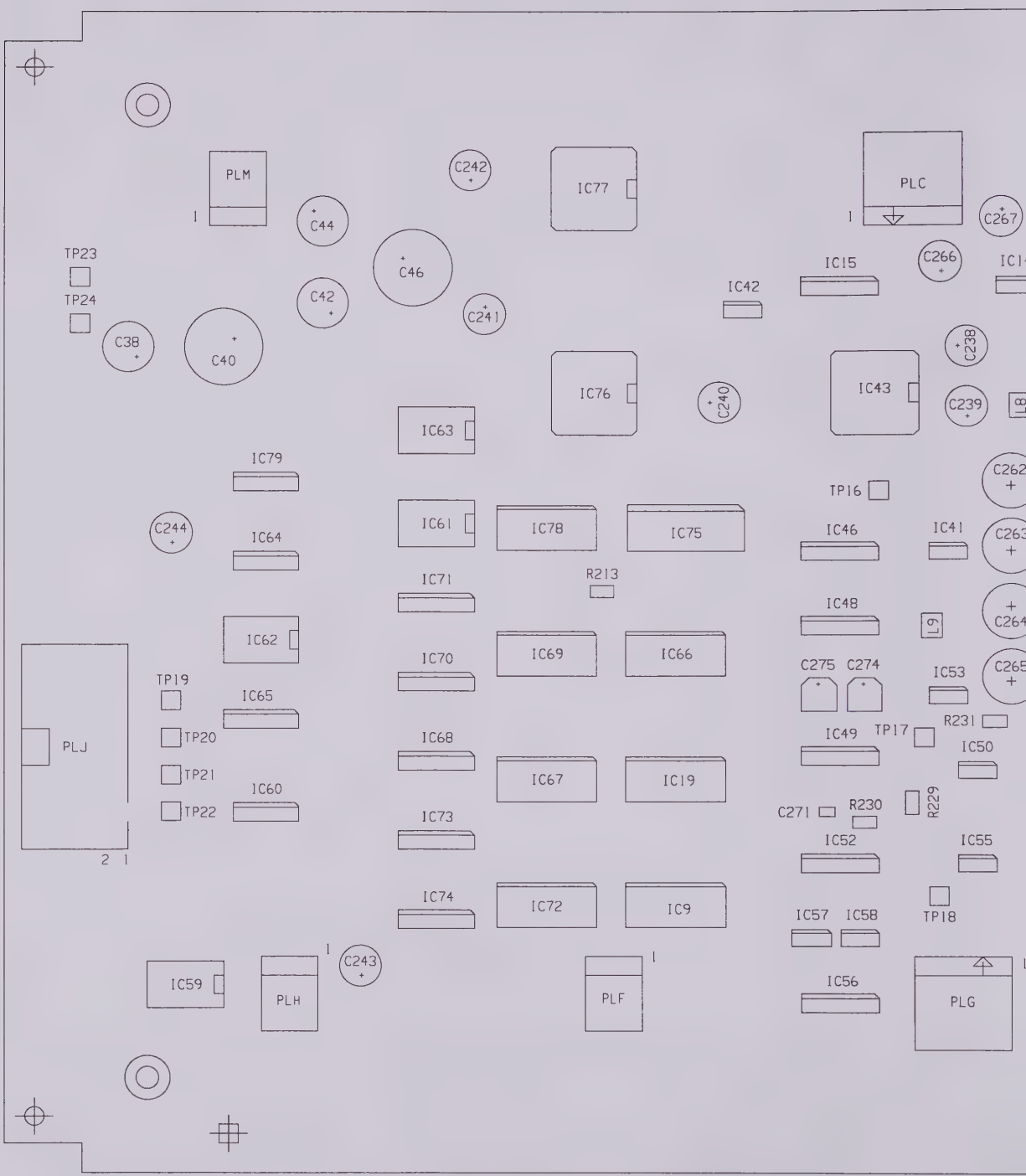
Fig. 7-42 A2/2 Audio processor 2 - component layout

Vertical shift, ext mod scaling, calibration ref gen **A2/2**

Signal selection, RMS to DC converter and ADC **A2/2**

Squelch control, loudspeaker, and audio count channels **A2/2**

Peak detector **A2/2**



I²C interface, supply regulators **A2/2**

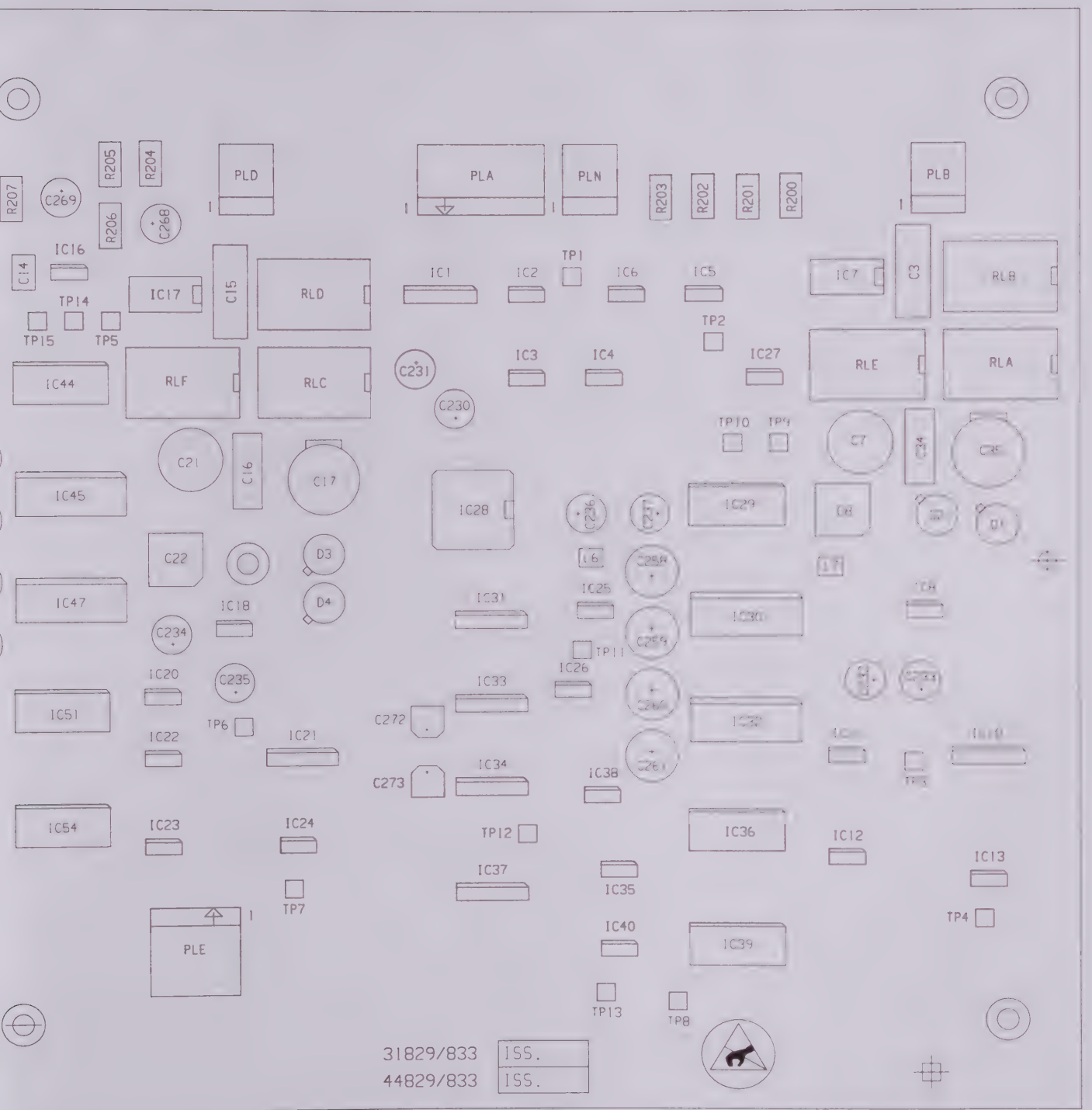


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Fig. 7-48 A3 Audio processor 1 - component layout, component side

Audio processor 1, solder side **A3**

AF input and AF scope gain **A3**

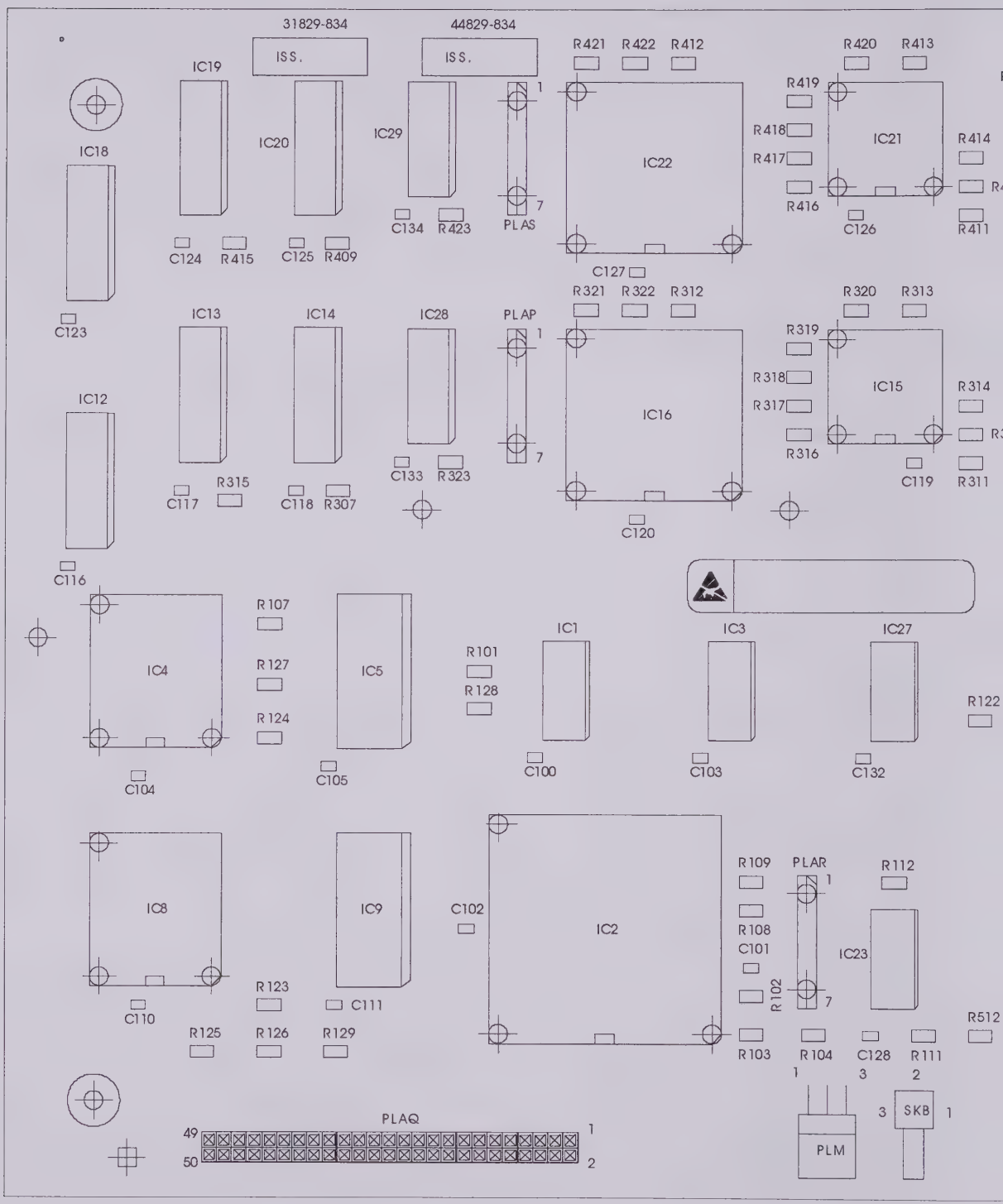
Demodulation input selection, ext mod input and gain **A3**

AF filter **A3**

Demodulation filters and scope attenuator **A3**

I²C receivers, decoders, and relay drivers **A3**

Input and gain selector and filter decoders **A3**



Power supply and decoupling arrangements A3

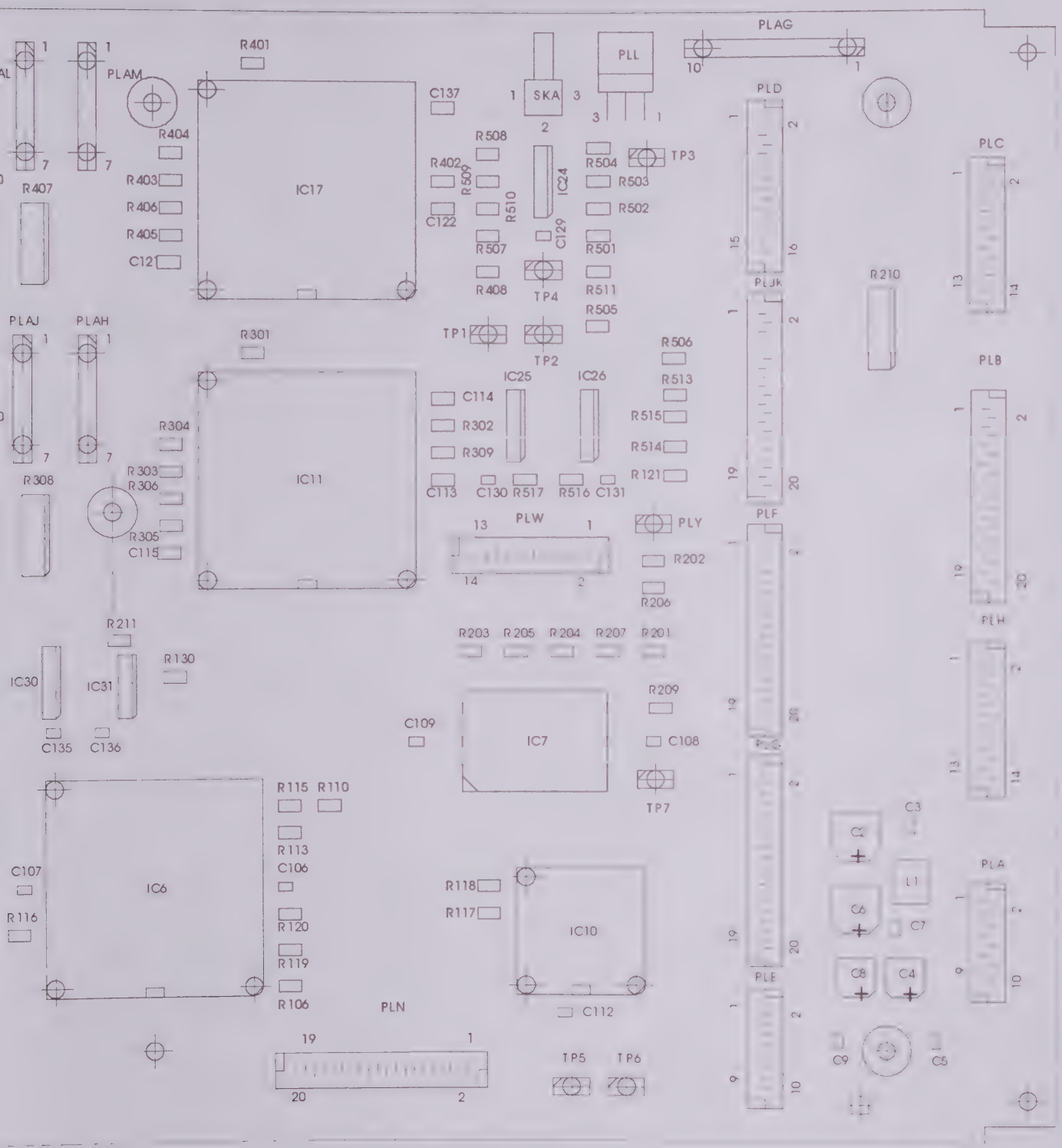


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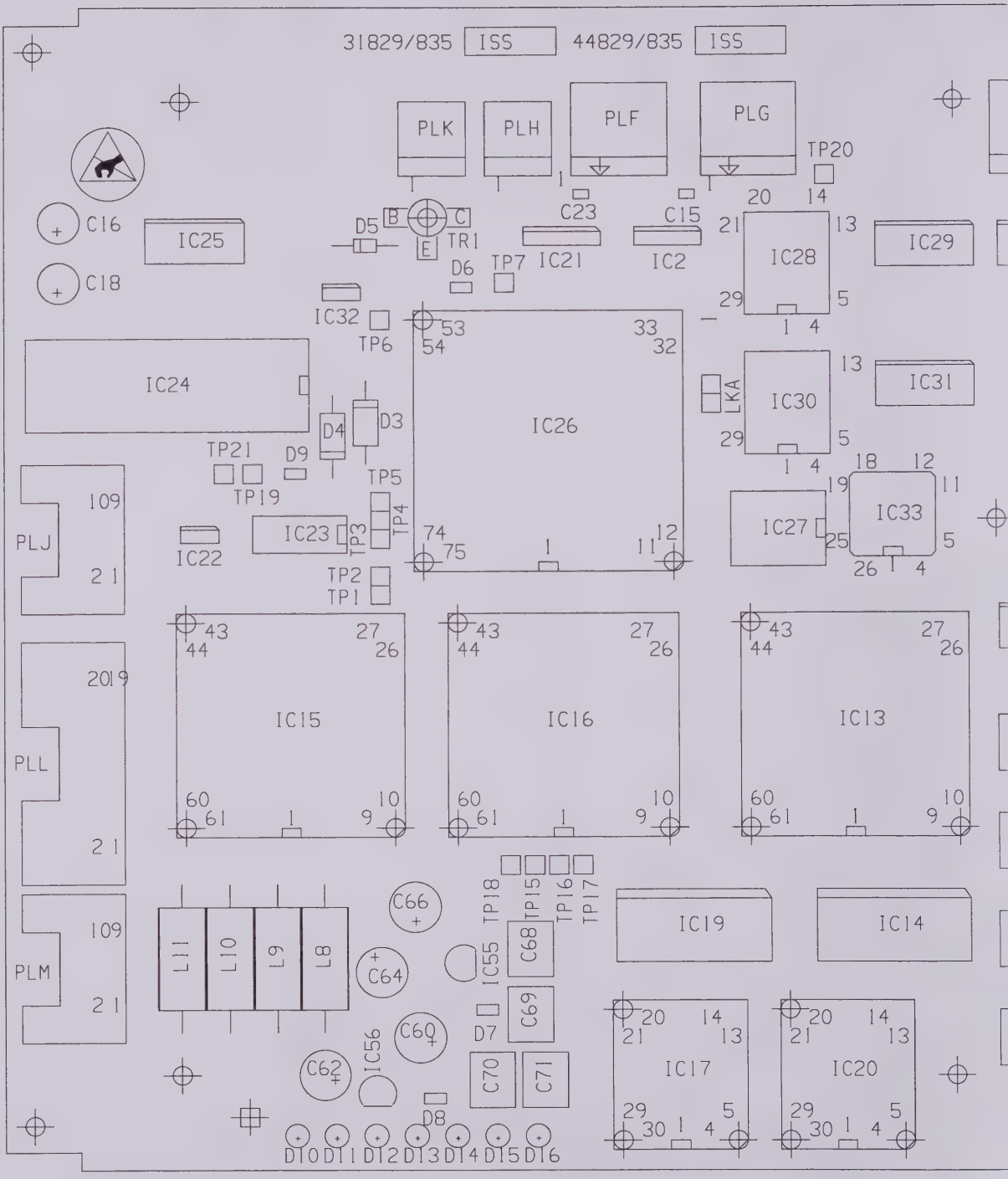
Fig. 7-57 A4 Host processor - component layout

68000 processor, decoding and DTACK, RAM, EPROM, PIT **A4**

PPH - A8 interface A4

Receive (uplink) traffic processor DSP **A4**

Transmit (downlink) traffic processor DSP **A4**



DSP clock and A4 power supply distribution A4

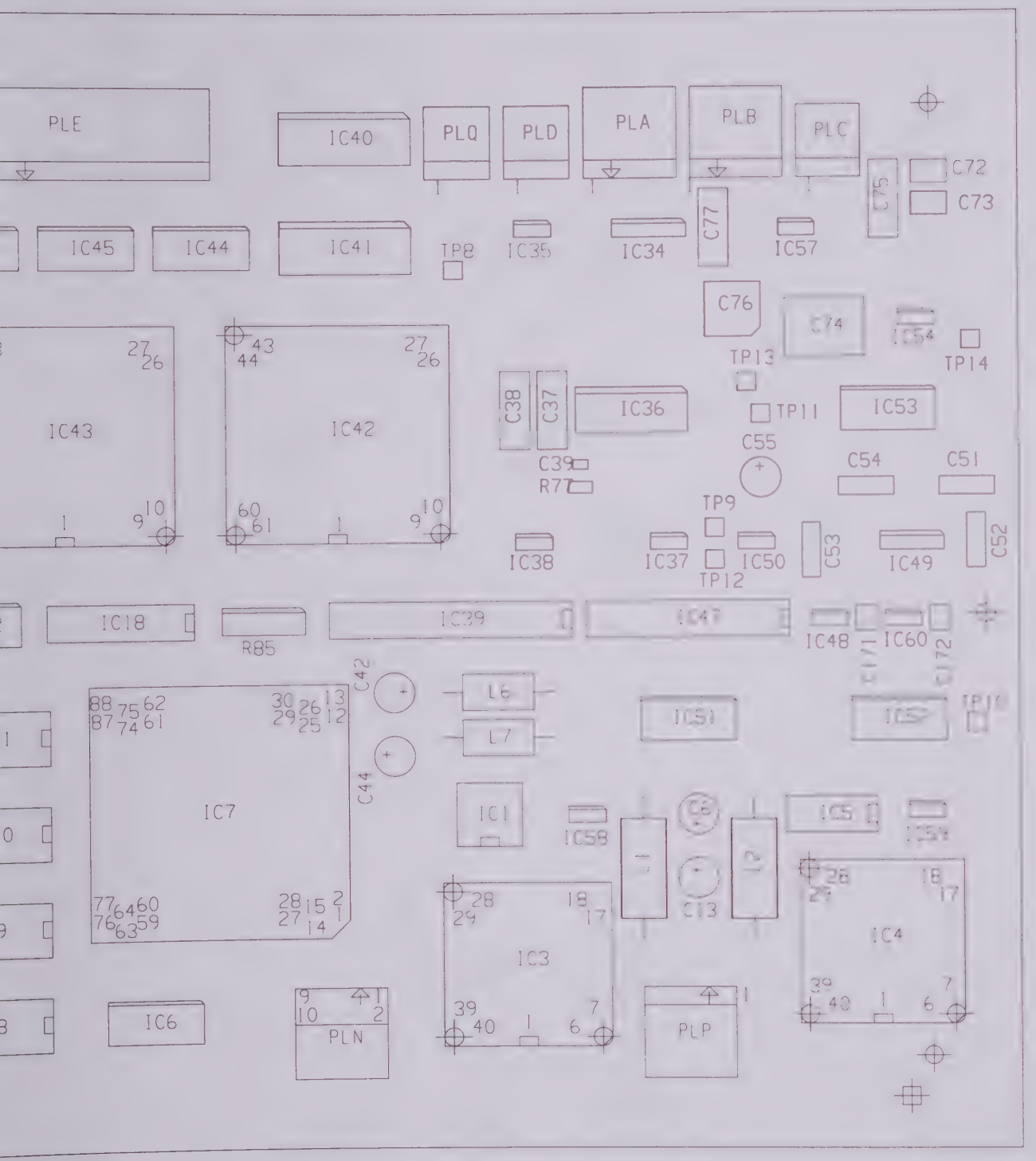


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Fig. 7-63 A5 Display - component layout, component side

Component layout **A5**

Graphics A5

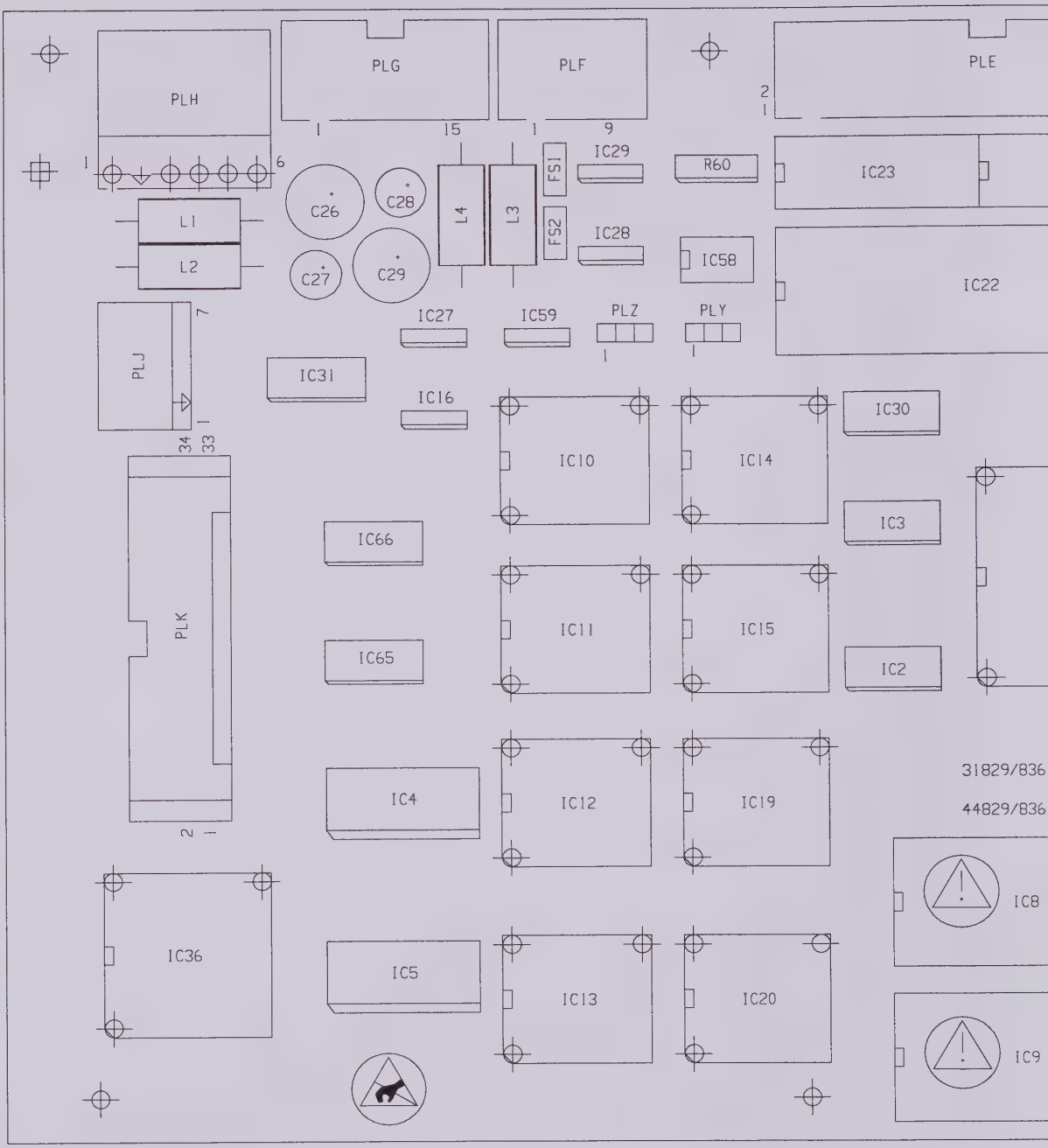
Main processor A5

Scope A5

Digital signal processor **A5**

Digital to analogue converters A5

Connectors and power inputs **A5**



Power supply and decoupling arrangements A5

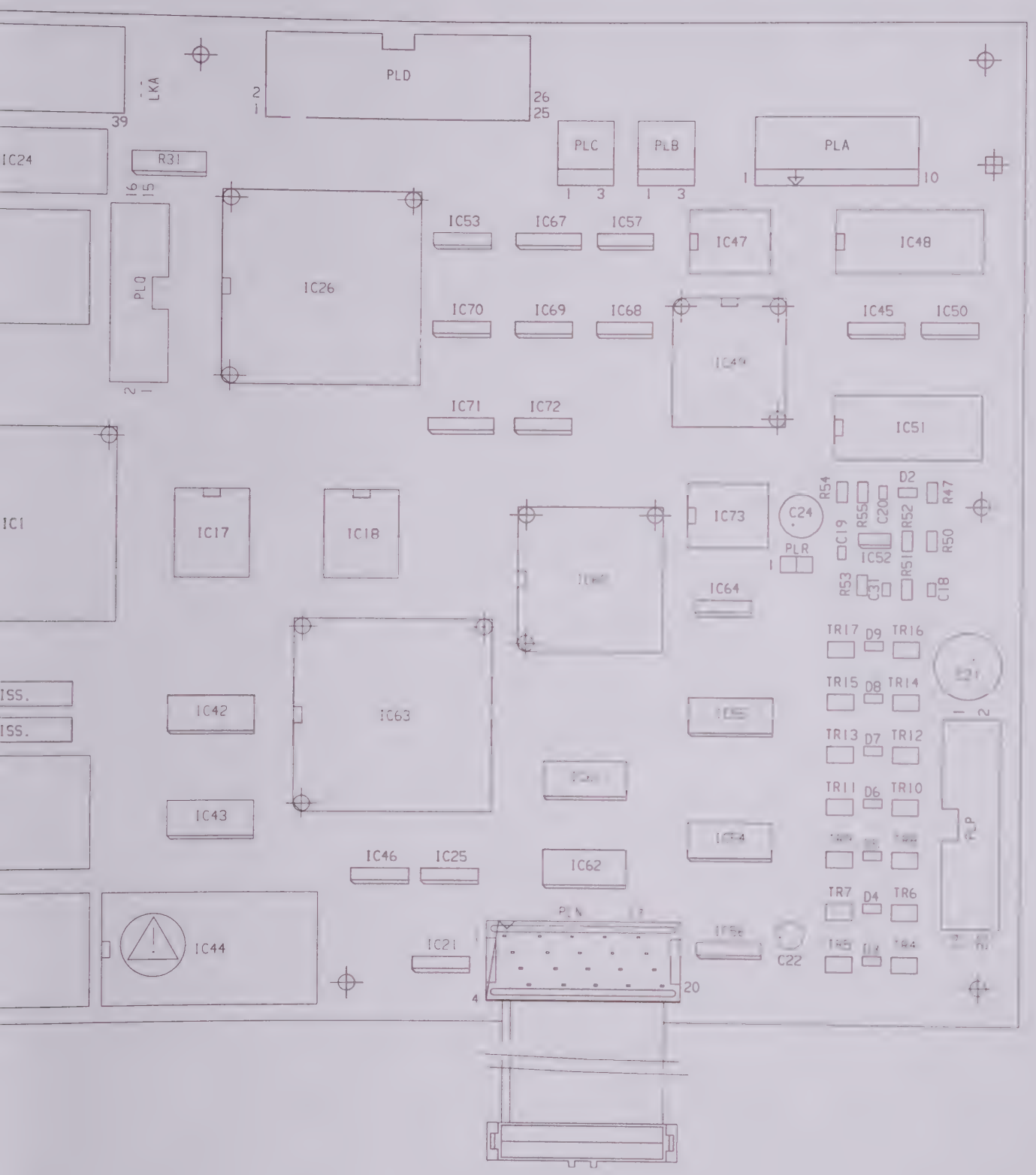


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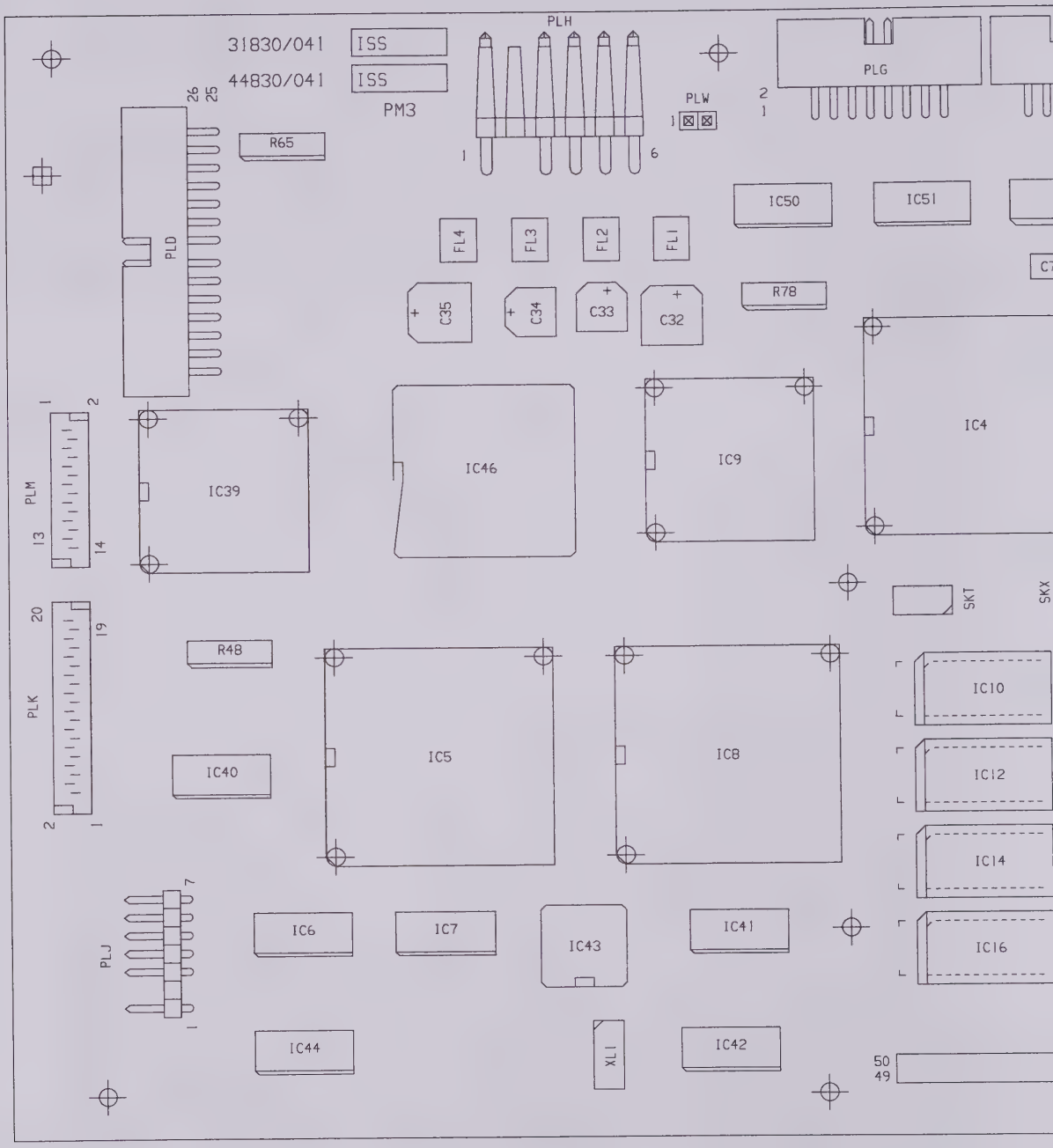
Fig. 7-72 A6 CPU - component layout, component side

Component layout **A6**

EPROM, EEPROM, RAM, Flash memory A6

A4/A5 bridge, serial/parallel port controller, real-time clock **A6**

Step attenuator drivers, ext ref status, control port **A6**



IF counter, VCO phase detector, loop filter, accessory I/F A6

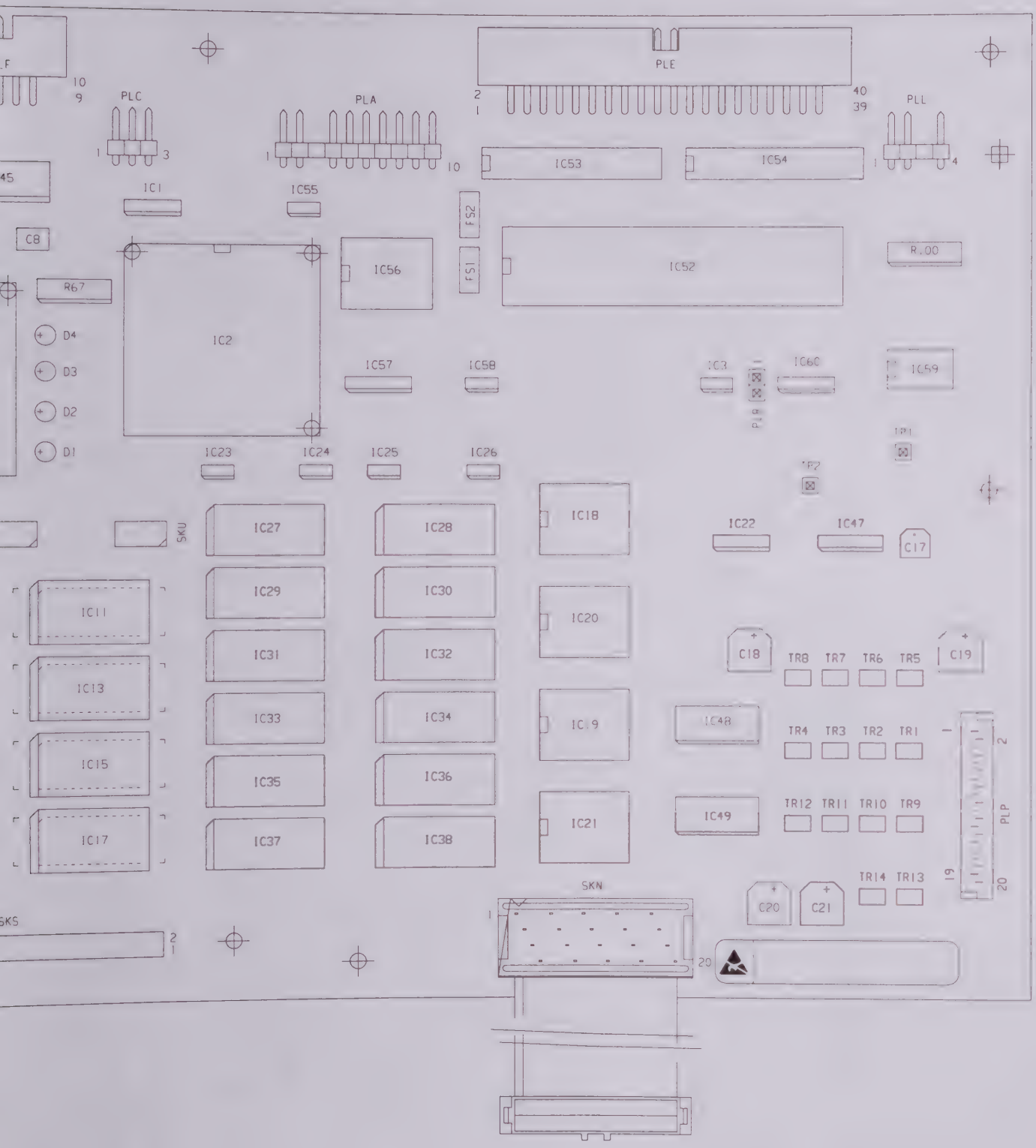


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Fig. 7-79 A6/2 CPU - component layout, component side

Component layout A6/2

CPU, interrupt handling A6/2

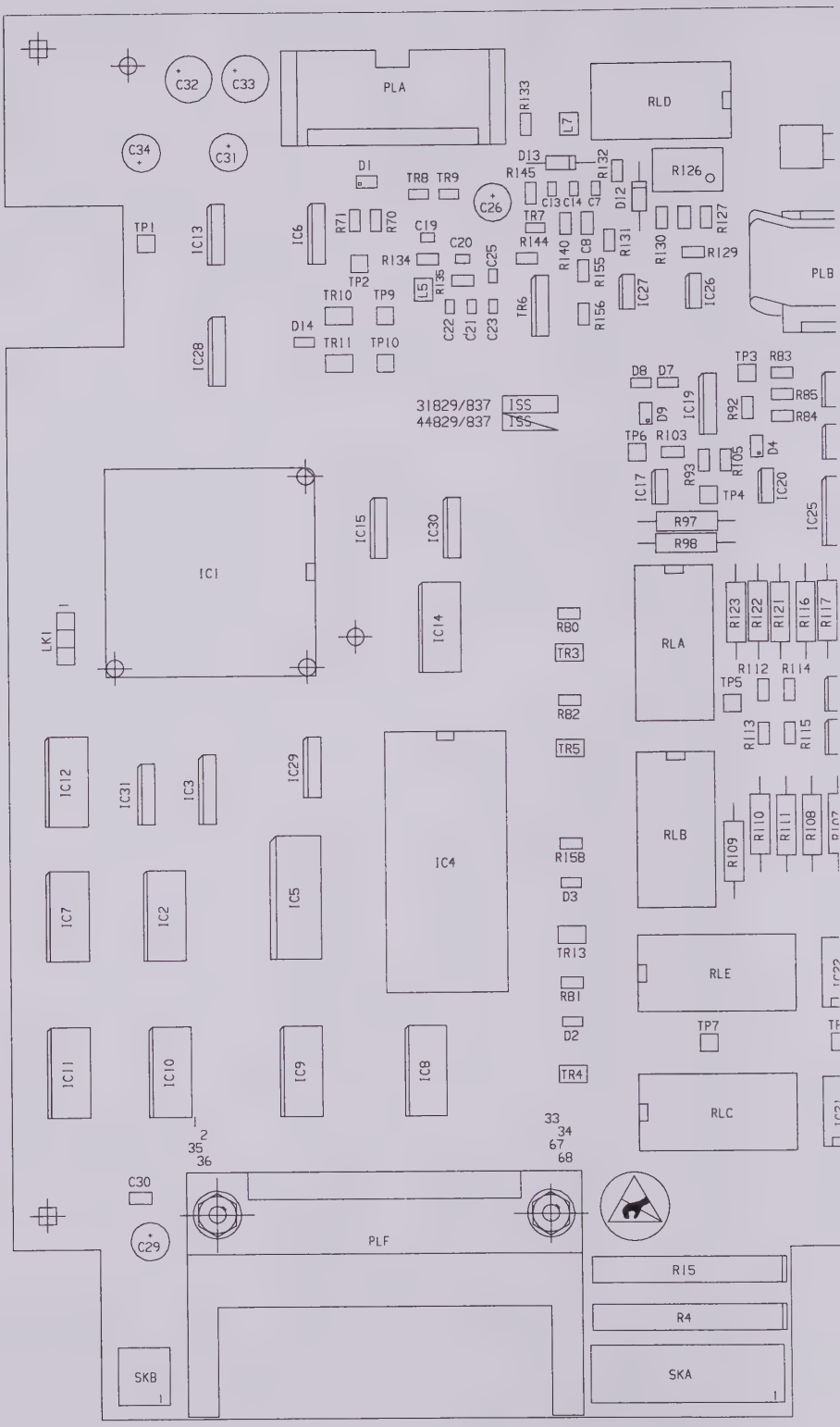
Decoding, Flash memory, EEPROM A6/2

Random access memory A6/2

A4/A5 bridge, serial/parallel port controller, real-time clock A6/2

Step attenuator drive, ODD signal I/O, GP I/F bus control **A6/2**

IF counter, VCO & phase detector, loop filter, accessory I/F **A6/2**



Power supply and decoupling, memory connect A6/2

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Fig. 7-88 A7 Front panel interface - component layout

Memory card interface **A7**

Clock buffer and dividers, multimeter control, PS I/O **A7**

RF calibrator **A7**

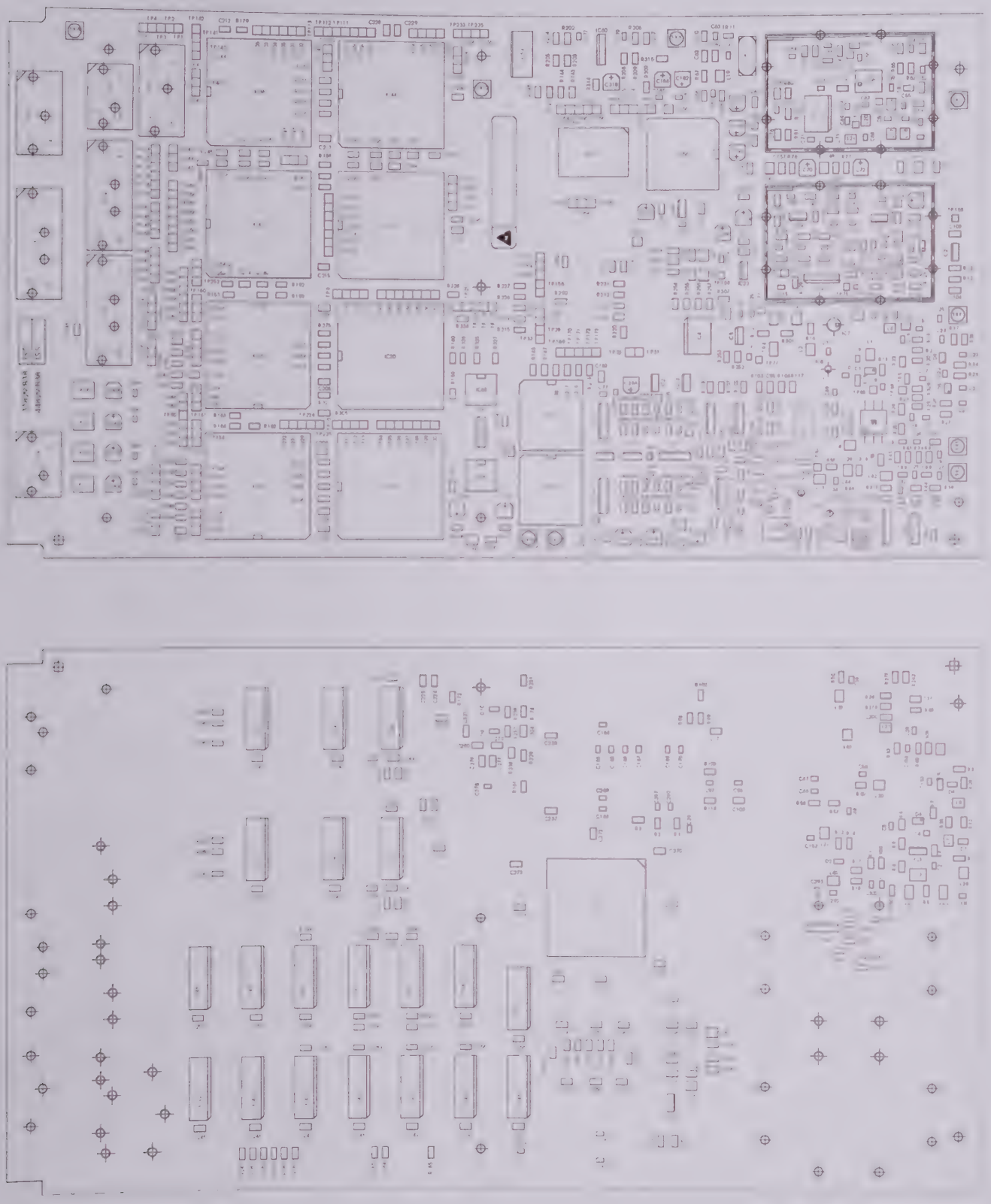

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Fig. 7-94 A8 Complex modem and IF - component layout

2 MHz, 15 MHz low-pass and 10 MHz band-pass filters, AGC **A8**

I and Q DACs, filters and modulators, quadrature generator **A8**

15 MHz low-pass filter, generator IF, 80 MHz LO drive **A8**

Voltage reference, levelling loop, and output attenuator **A8**

VCO and loop filter **A8**

External program & data memory, I samples FIFO **A8**

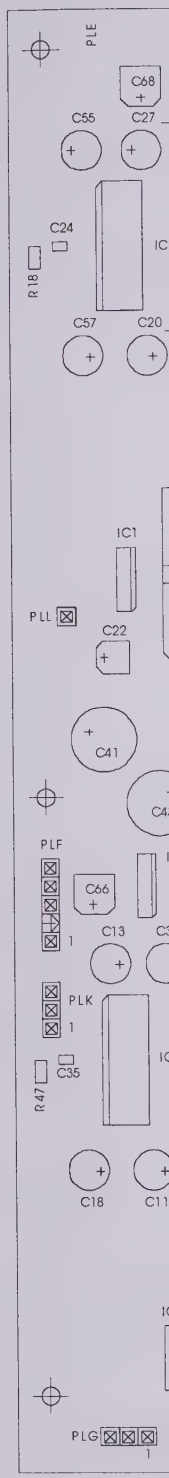
External program & data memory, I samples FIFO A8

External program & data memory **A8**

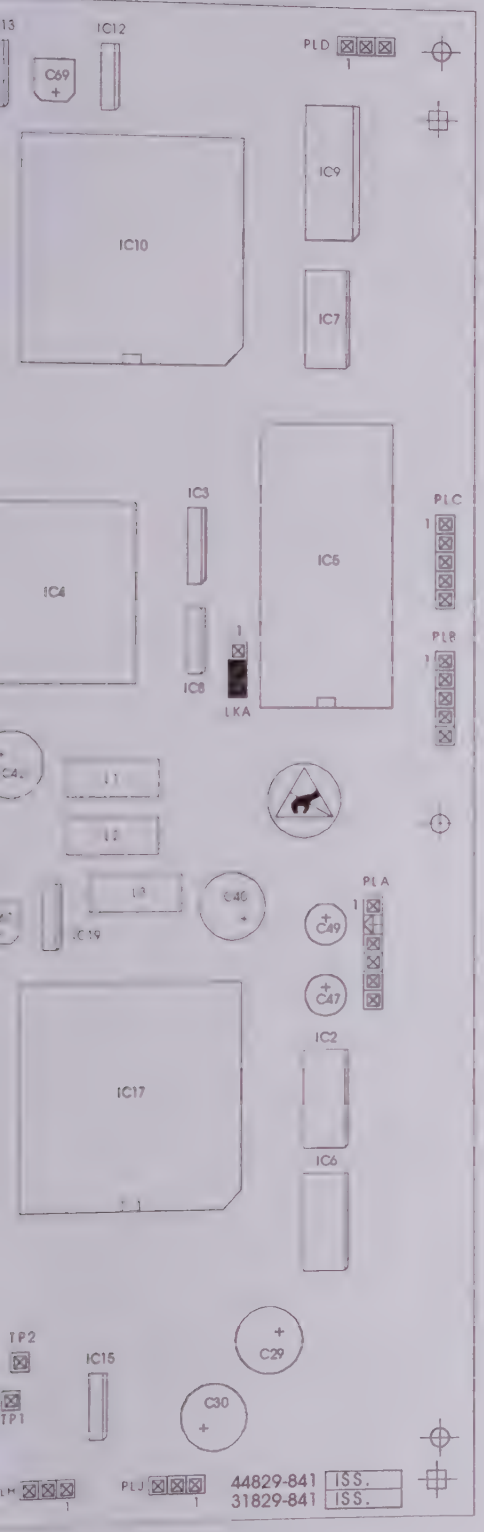
External program & data memory

Rx sampling clock recovery & flash ADC, AGC setting DAC **A8**

Reference frequency switches A8



Power supply and decoupling arrangements A8



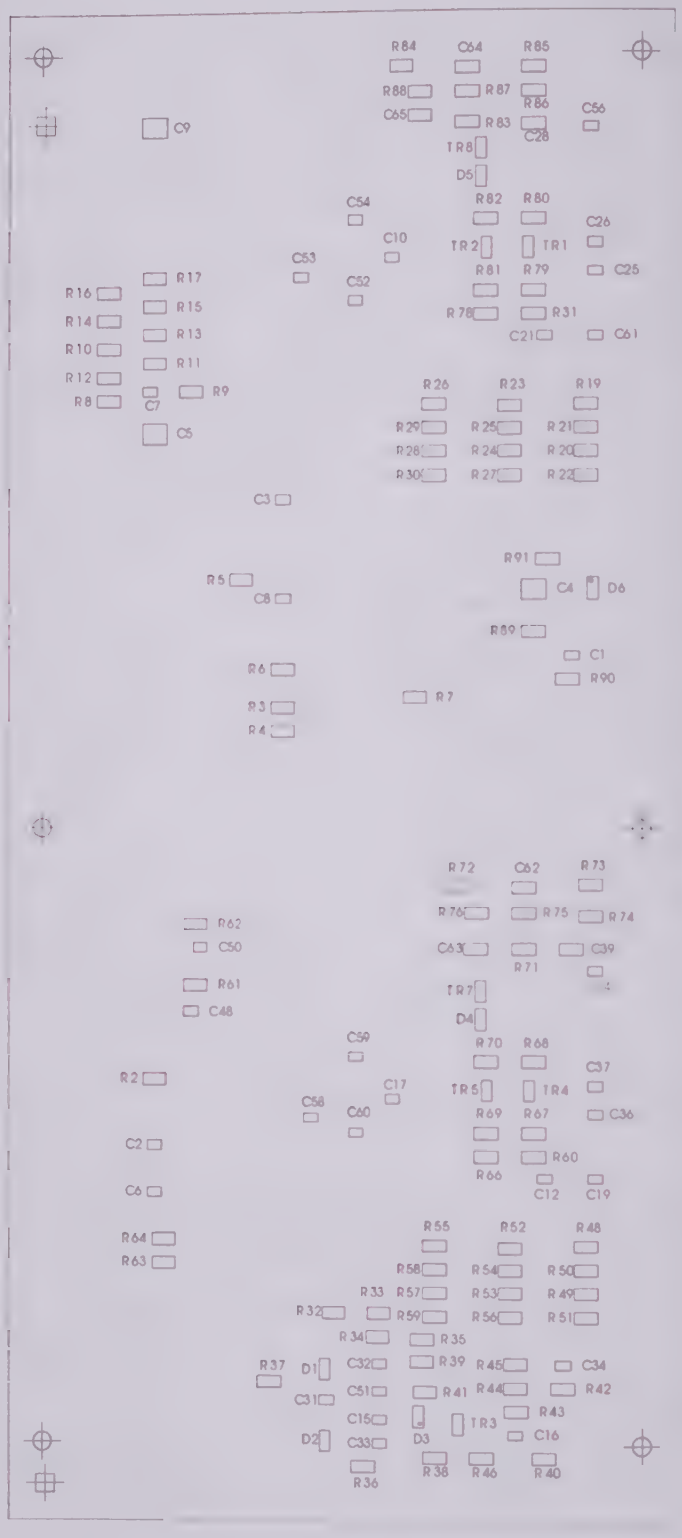


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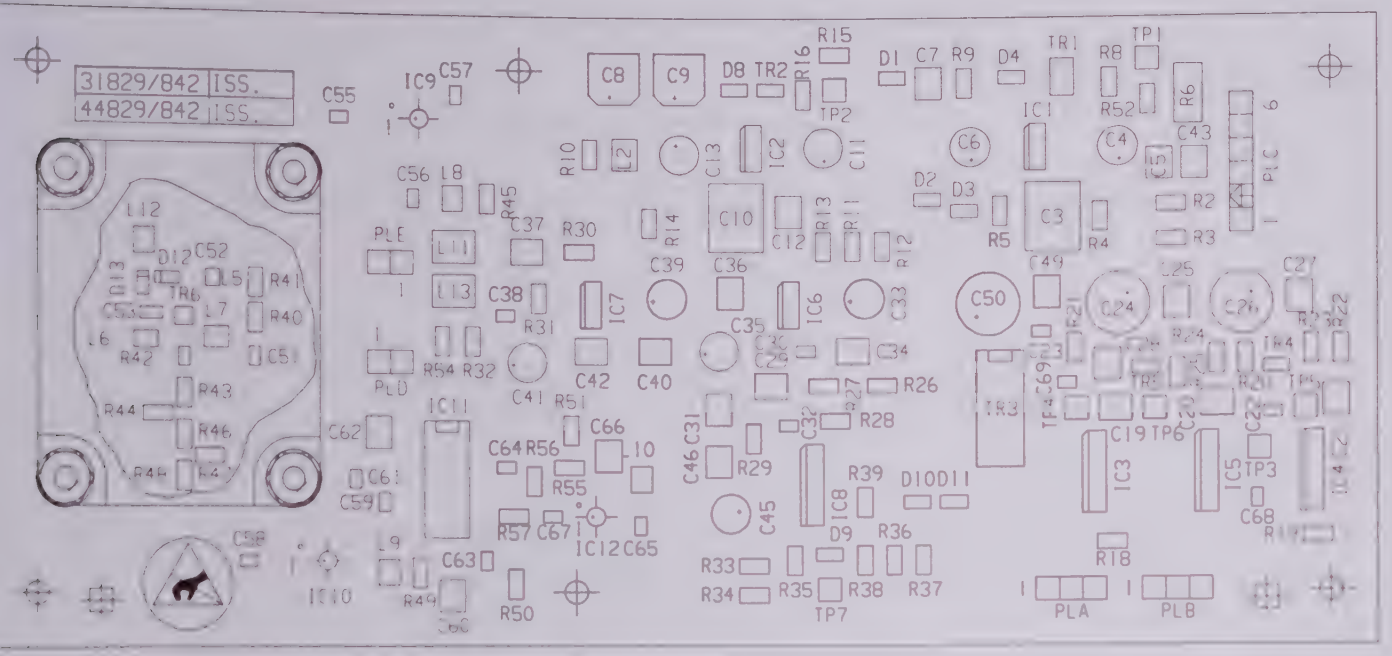
Fig. 7-108 AE1 Fractional-N control - component layout

Rx fractional-N control AE1

Tx fractional-N control AE1

Power supplies AE1



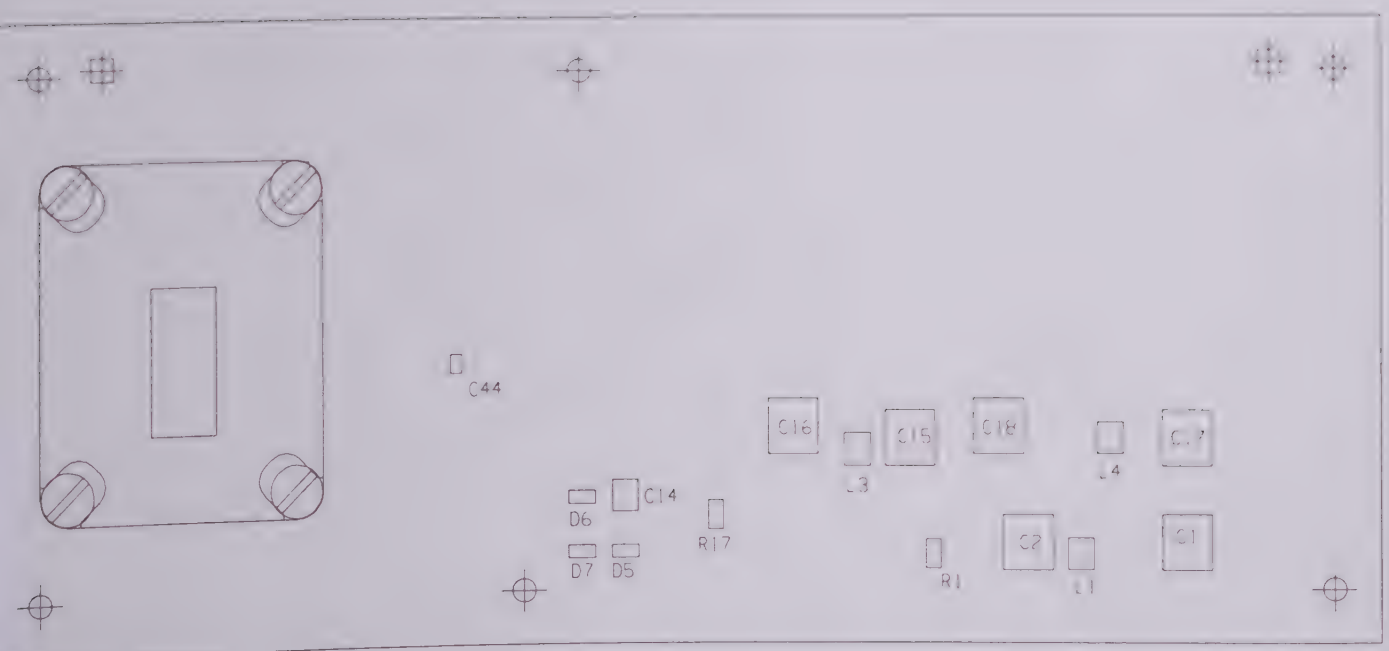


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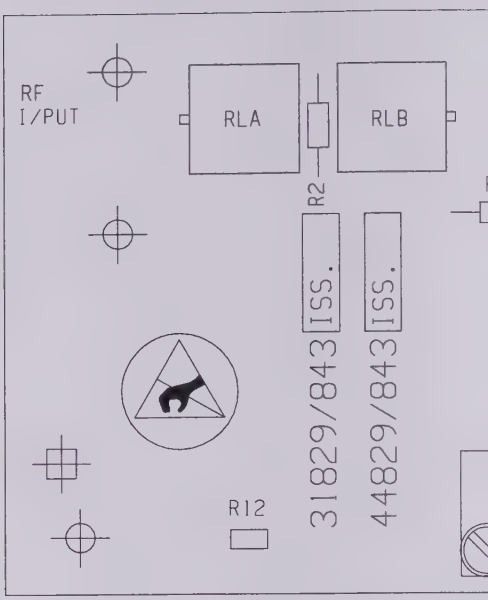
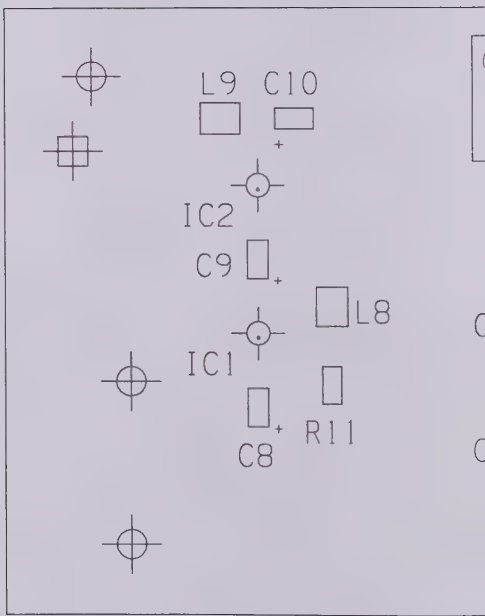
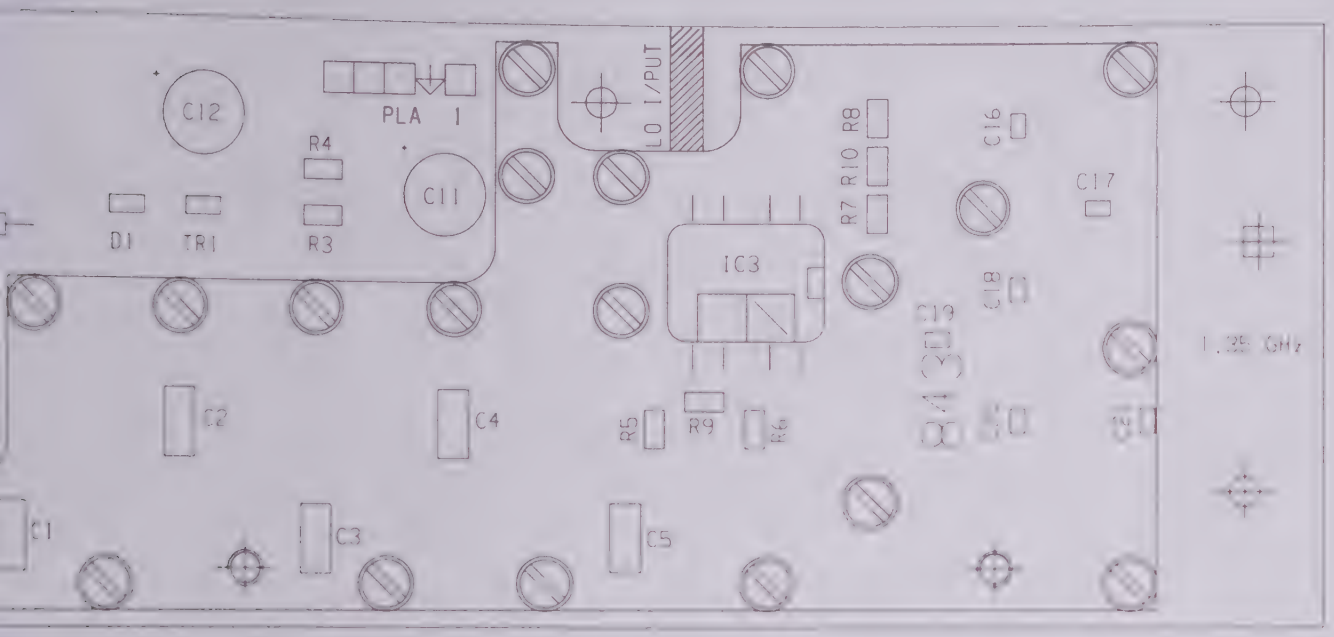
Fig. 7-114 AE2 1st LO synthesizer - component layout





1st LO synthesizer AE2



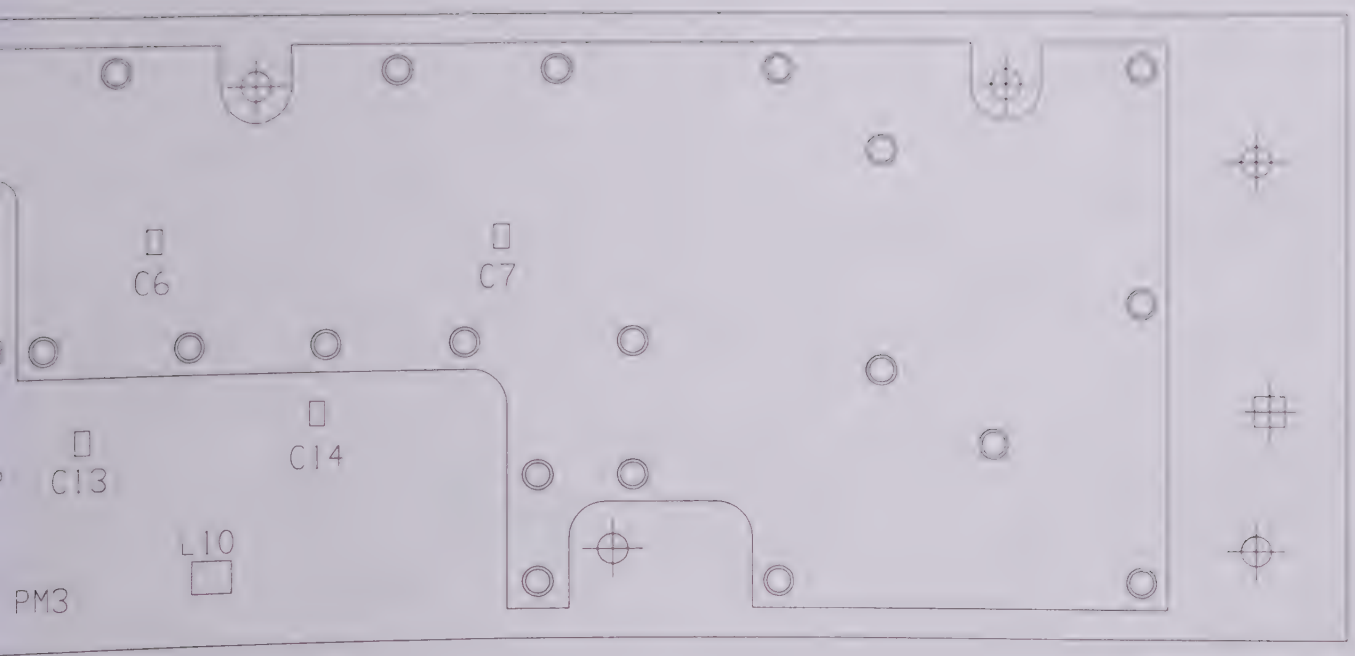


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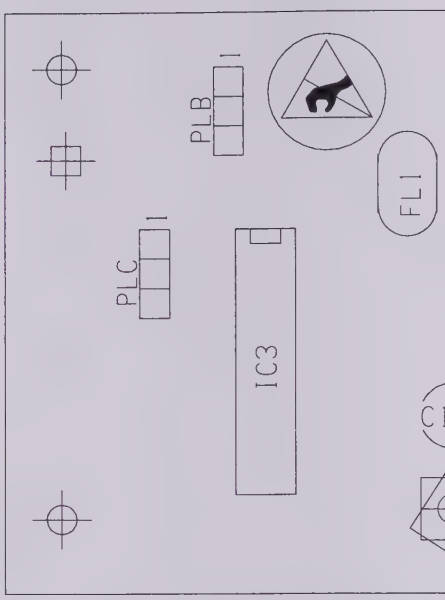
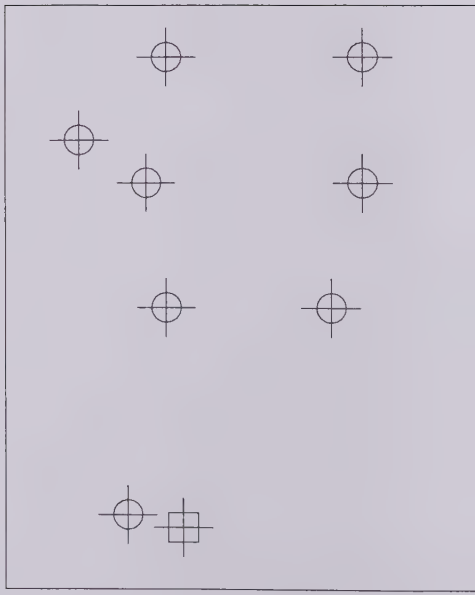
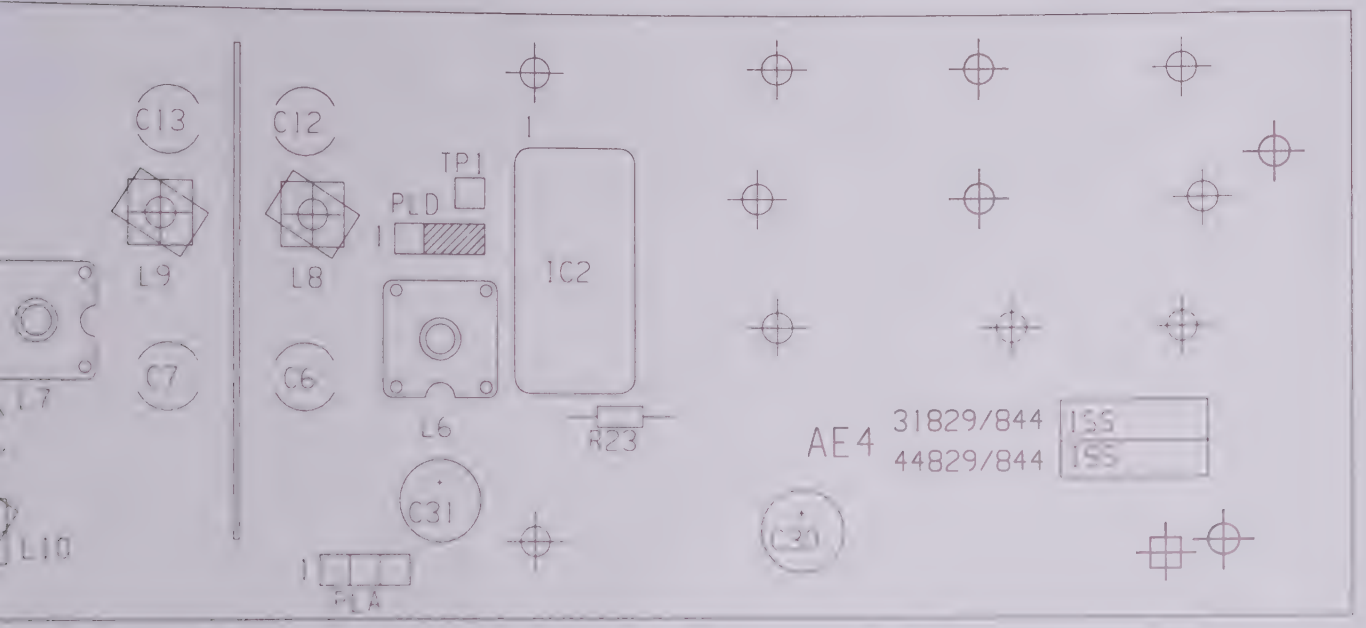
Fig. 7-116 AE3 1st mixer - component layout





1st mixer AE3



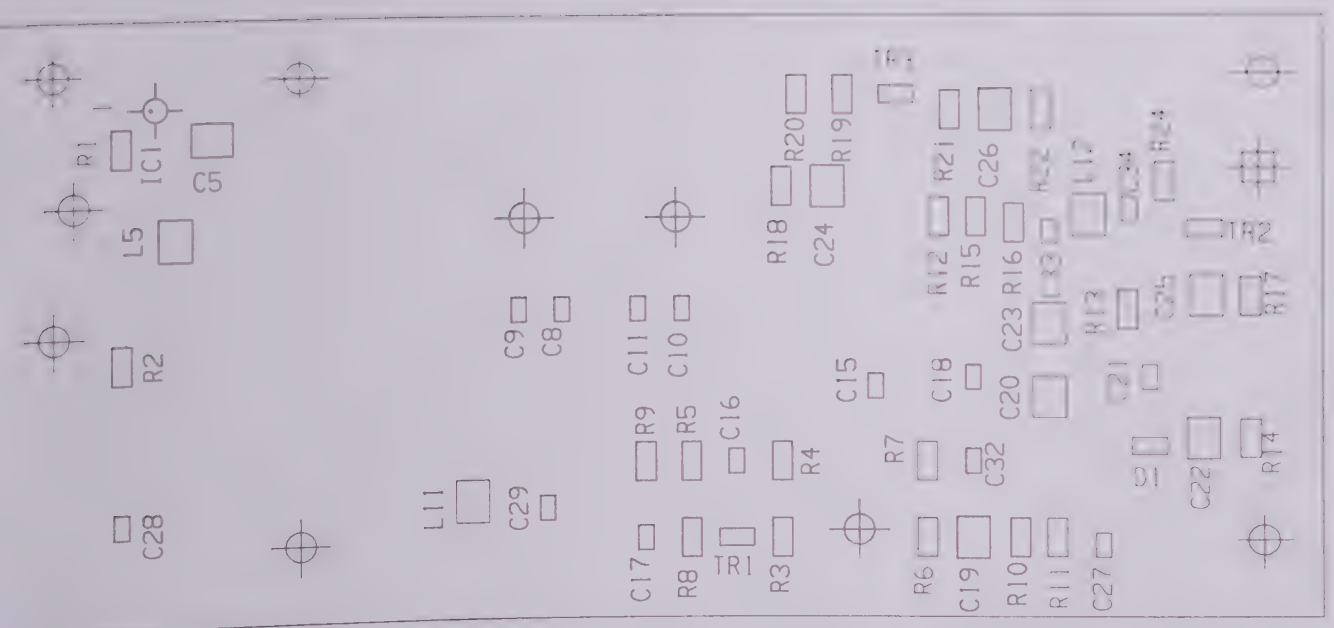


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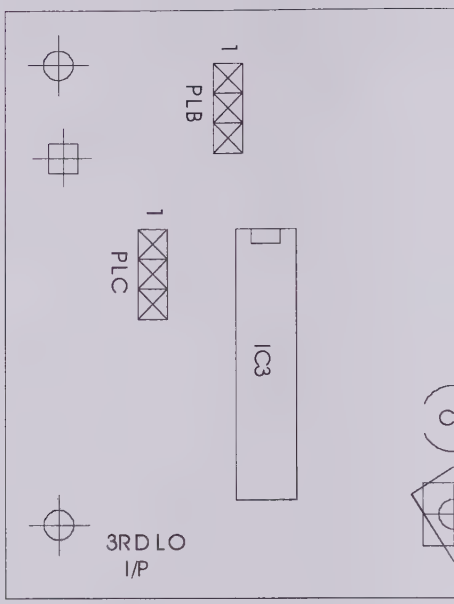
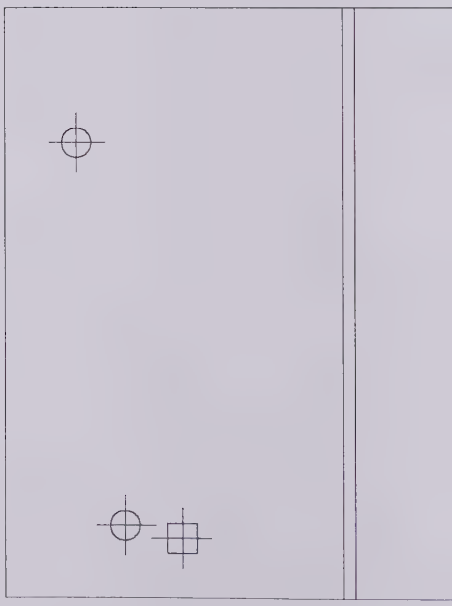
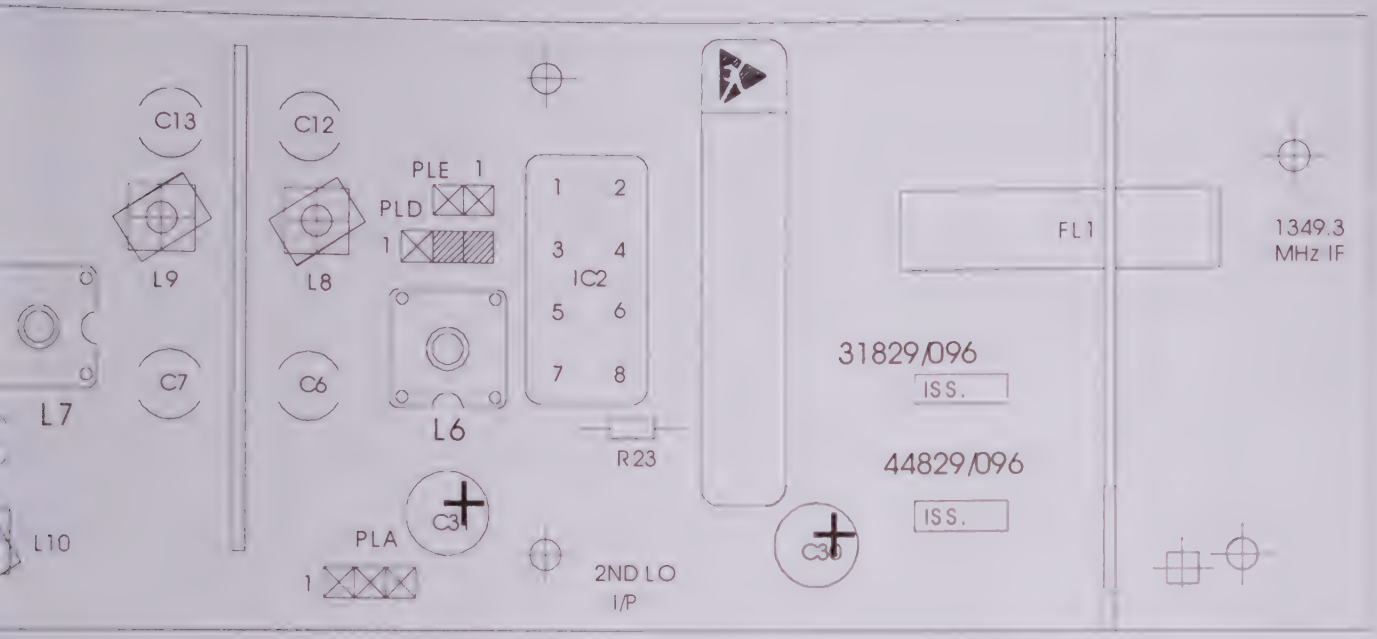
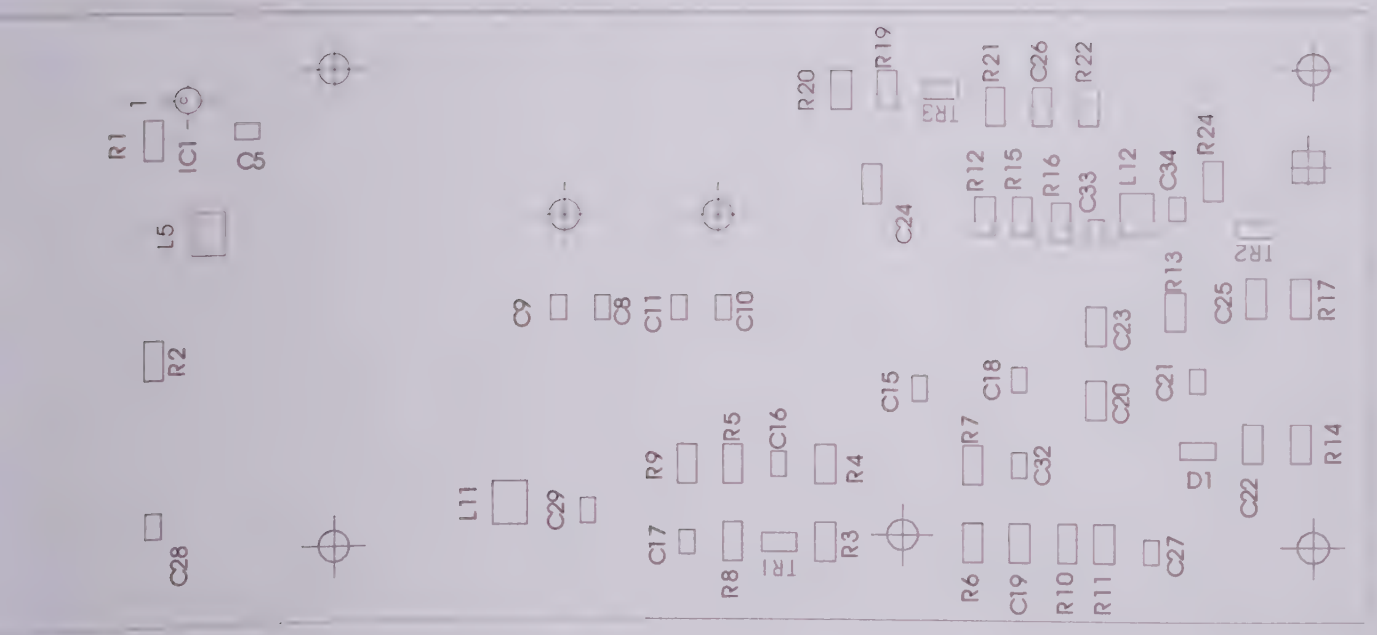
Fig. 7-118 AE4 1st and 2nd IF, 2nd and 3rd mixers - component layout





1st and 2nd IF, 2nd and 3rd mixers AE4





Drg. No. 44830/096 Sheet 1 of 1 Issue 2

Fig. 7-120 AE4/2 1st and 2nd IF, 2nd and 3rd mixers - component layout

1st and 2nd IF, 2nd and 3rd mixers **AE4/2**

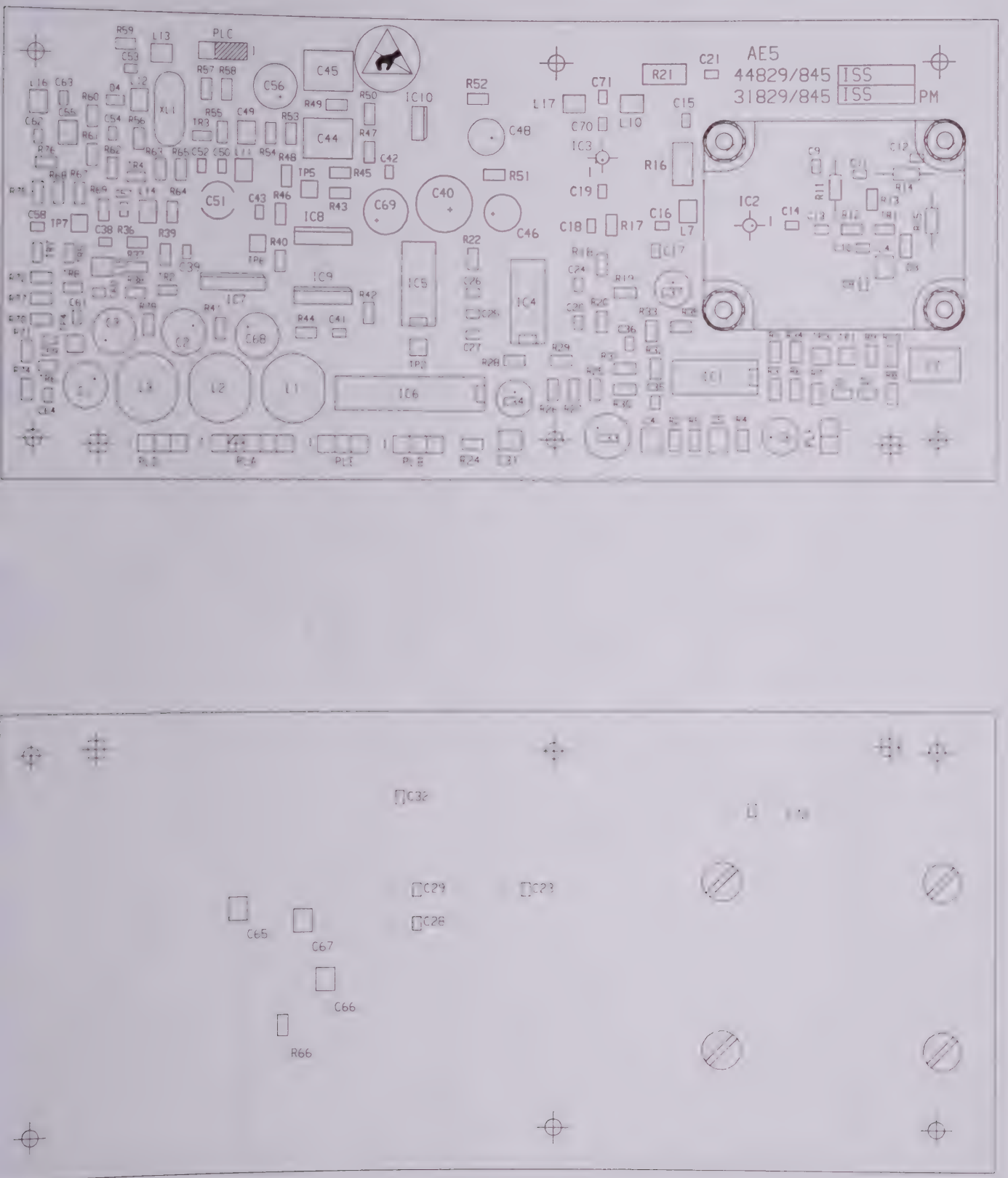


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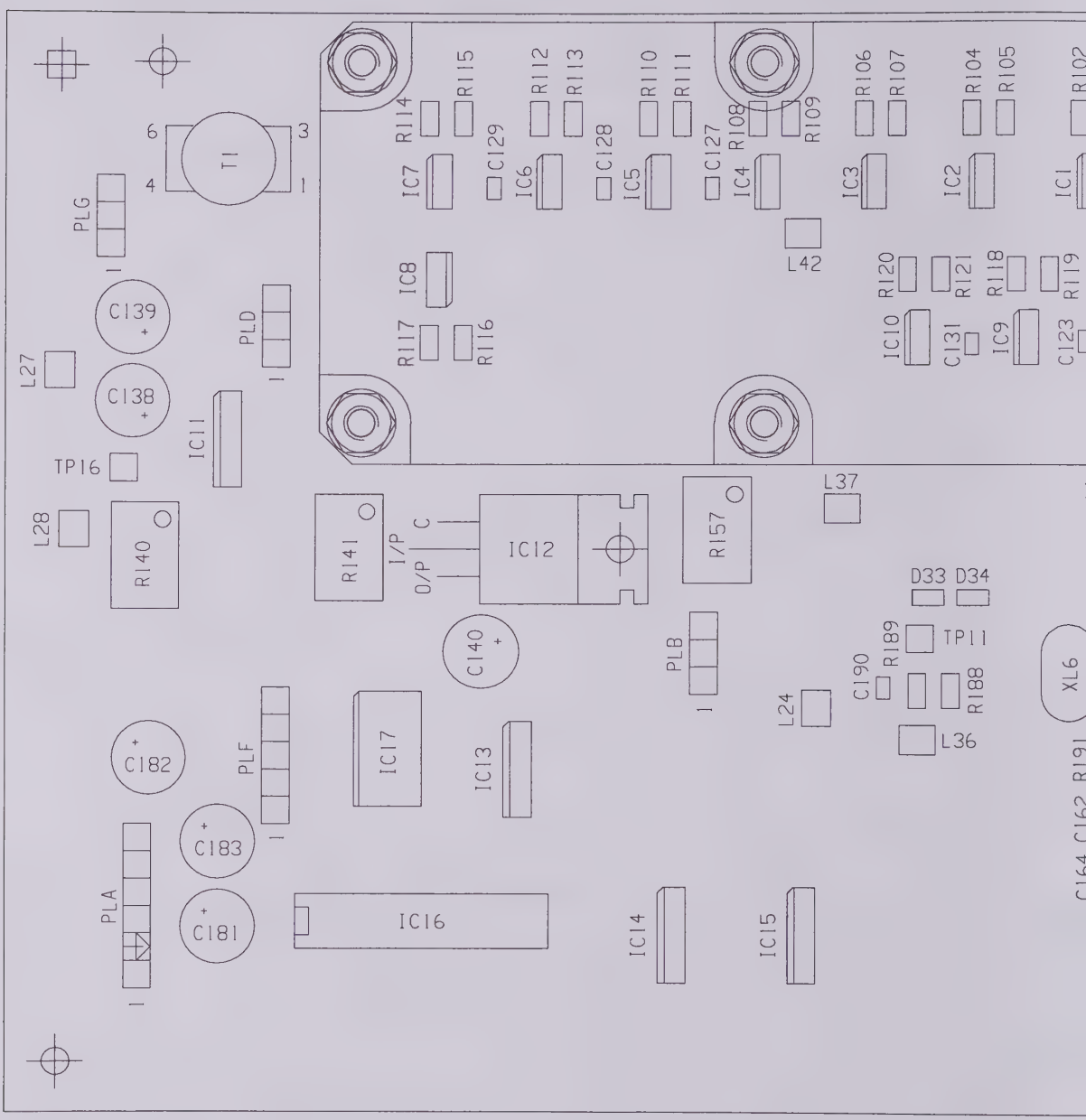
Fig. 7-122 AE5 2nd and 3rd LO - component layout



2nd and 3rd LO AE5

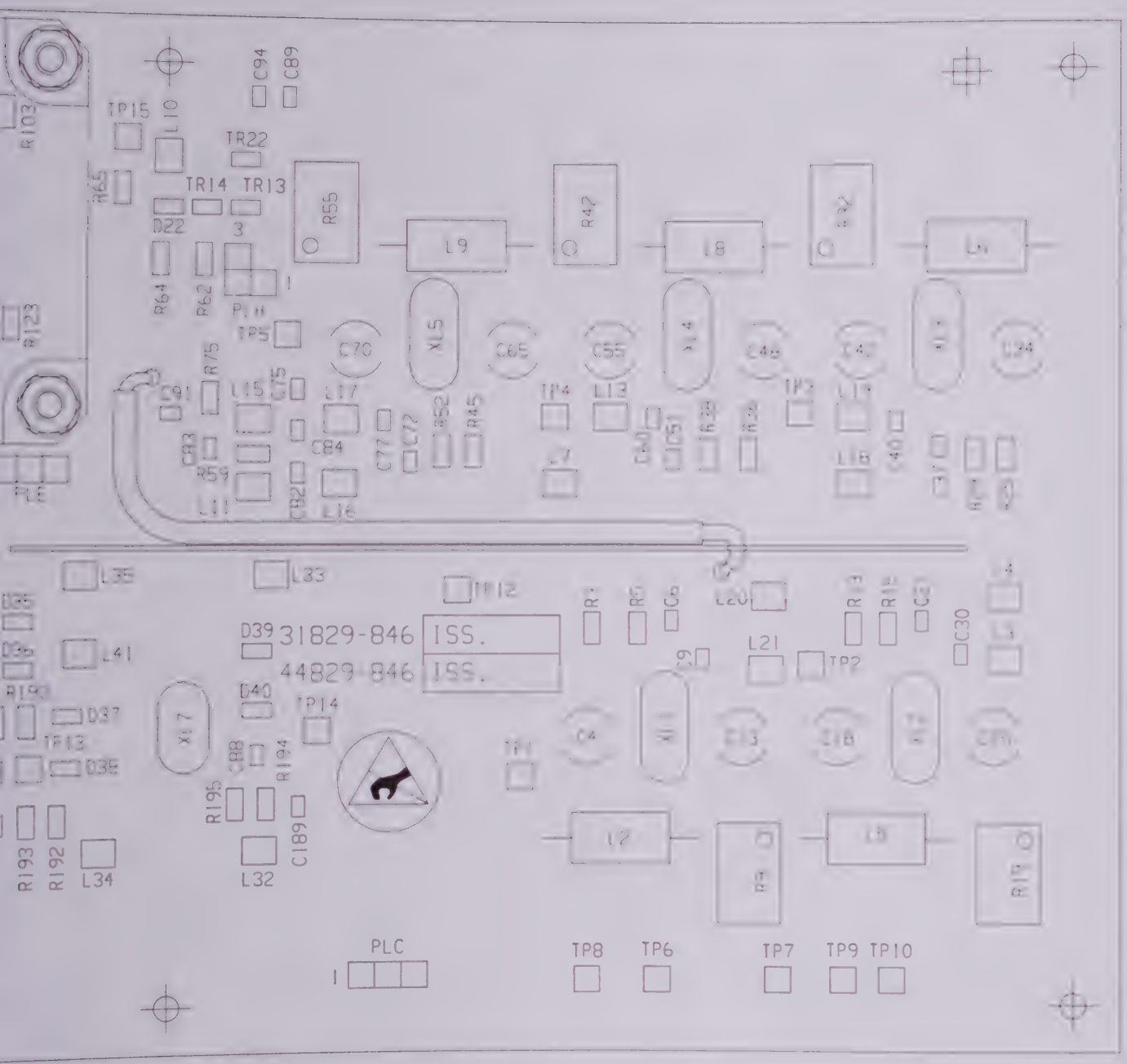


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Fig. 7-124 AE6 Spectrum analyzer - component layout, component side

110 kHz and 280 kHz filters, crystal filter control **AE6**

Crystal filters, stages 1 to 3 AE6

Crystal filters, stages 4 and 5 **AE6**

–6V regulator, log amplifier, video filter **AE6**

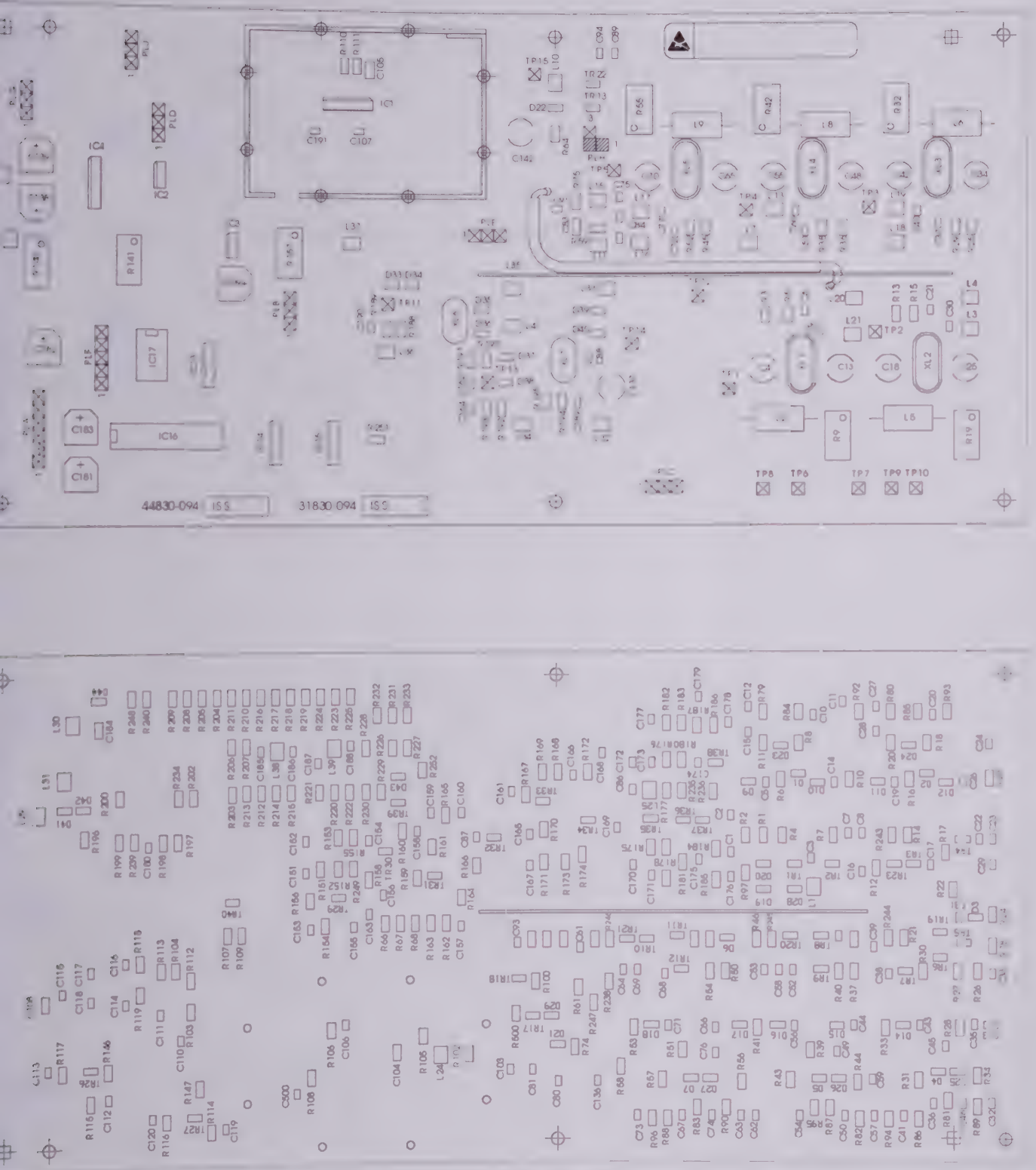

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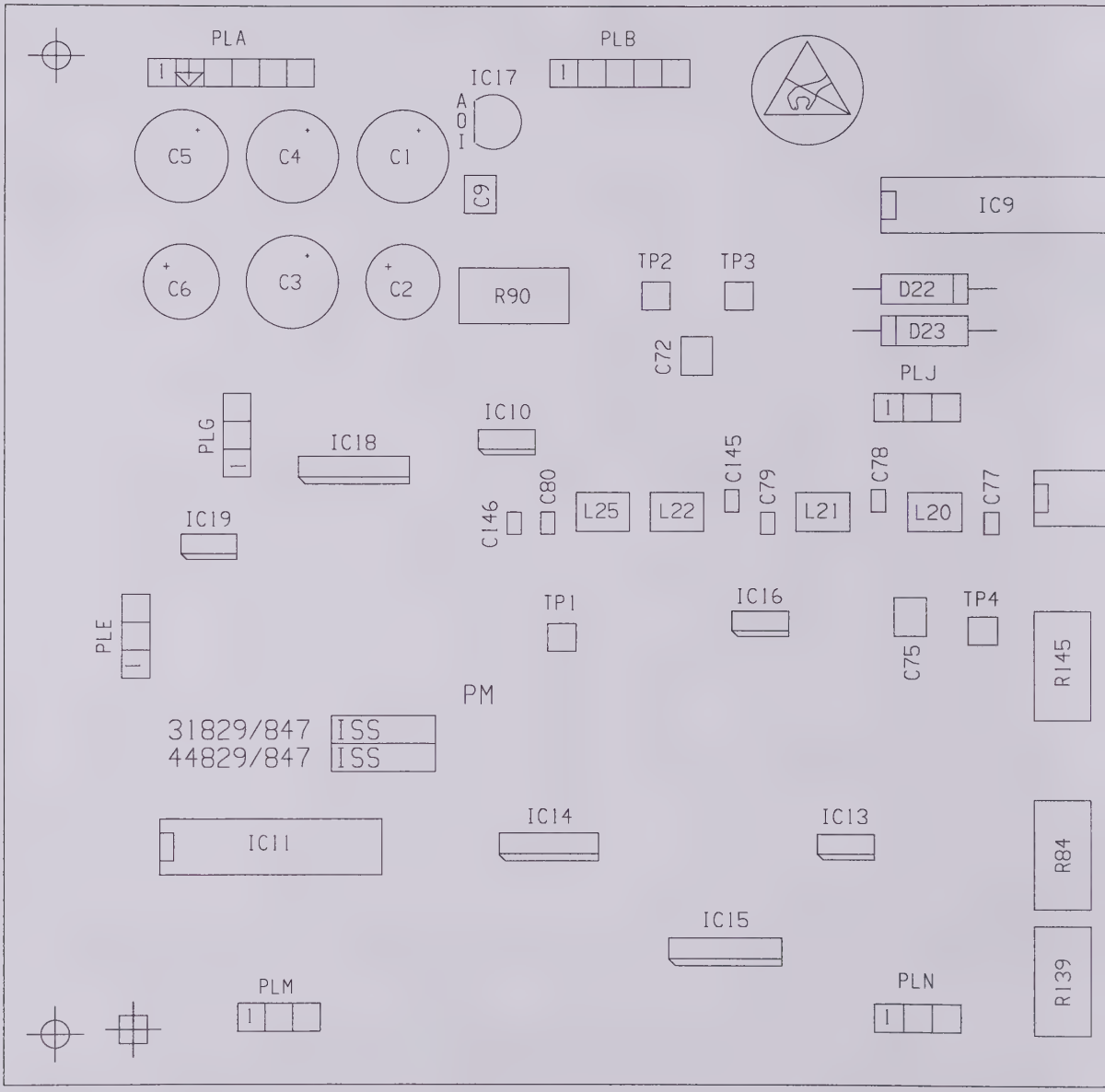
Fig. 7-130 AE6/2 Spectrum analyzer - component layout

110 kHz and 280 kHz filters, crystal filter control **AE6/2**

Crystal filters, stages 1 and 2 AE6/2

Crystal filters, stages 3 and 4 **AE6/2**



Log amplifier, video filter AE6/2

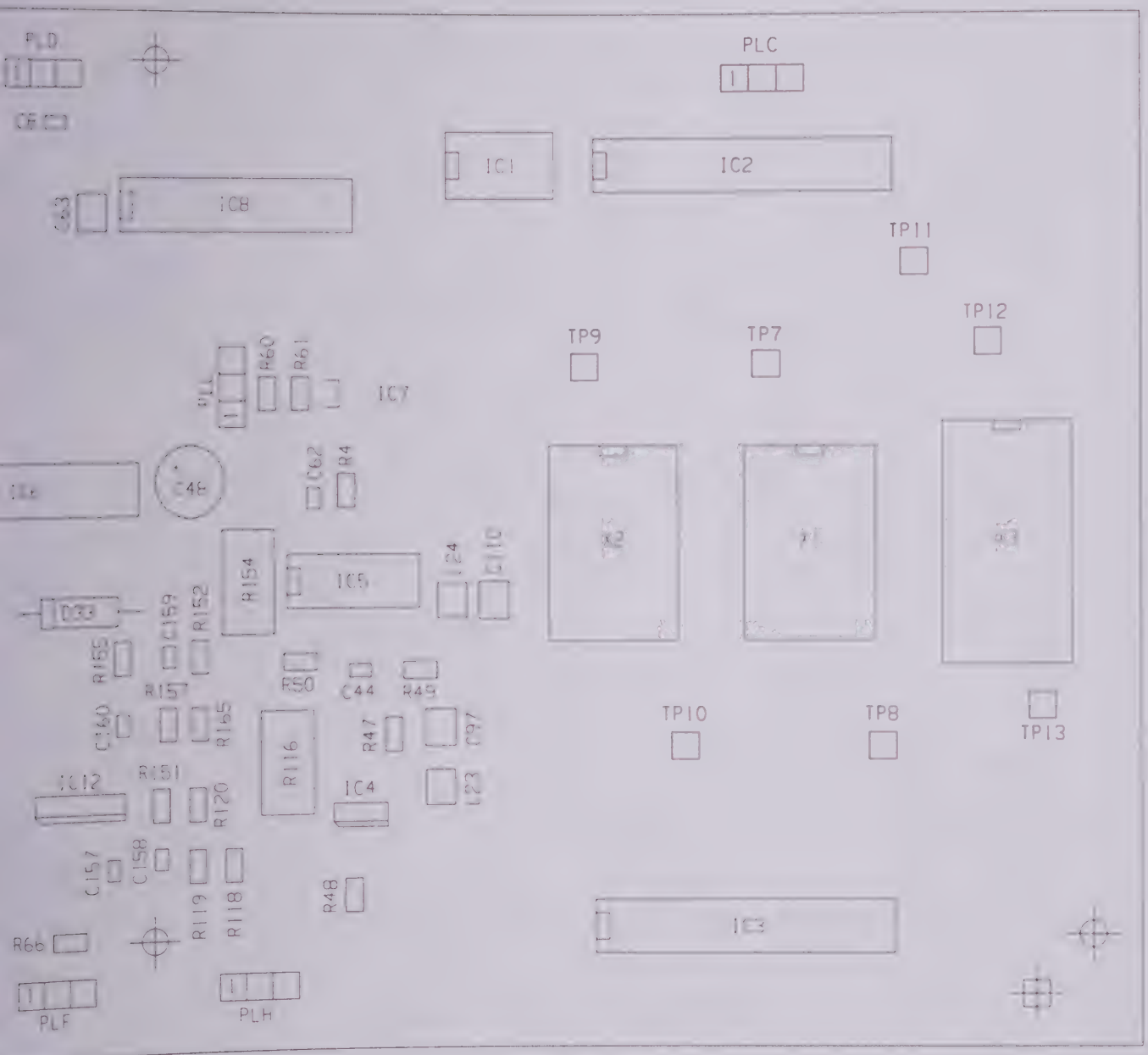


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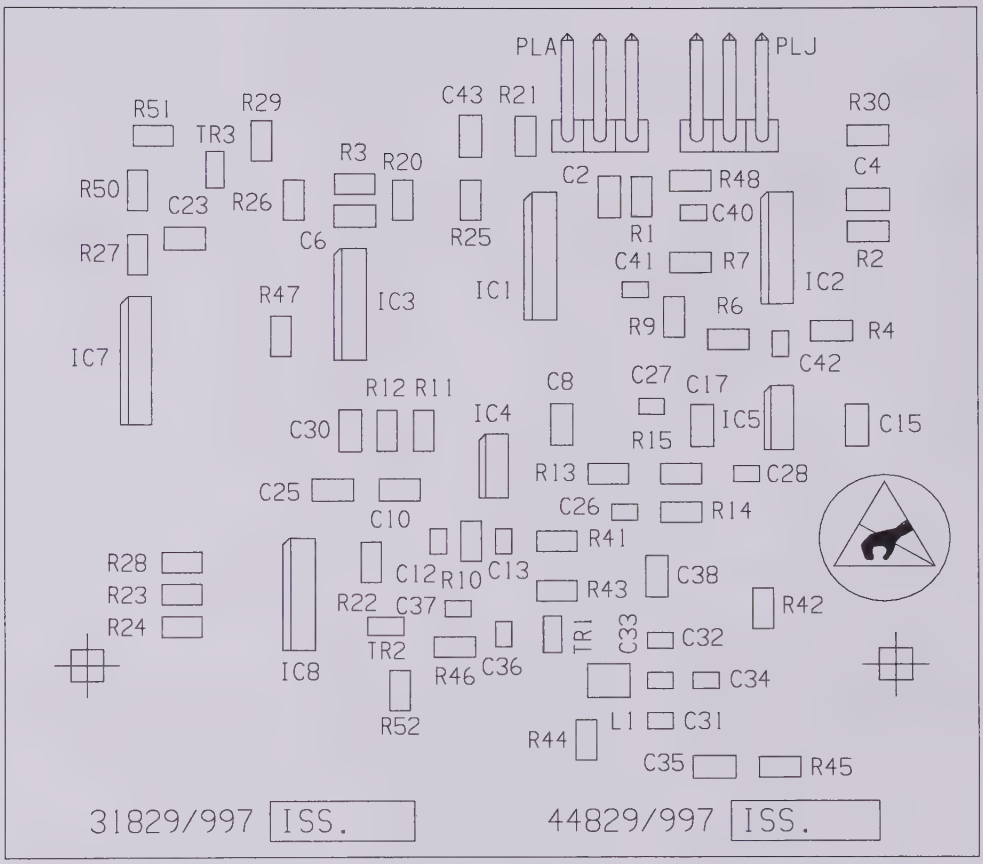
Fig. 7-136 AE7 Demodulation filter block - component layout, component side

Demodulation filter block, solder side **AE7**

SSB crystal filters, AGC attenuator **AE7**



FM offset correction and ranging, 80 kHz LP filter AE7

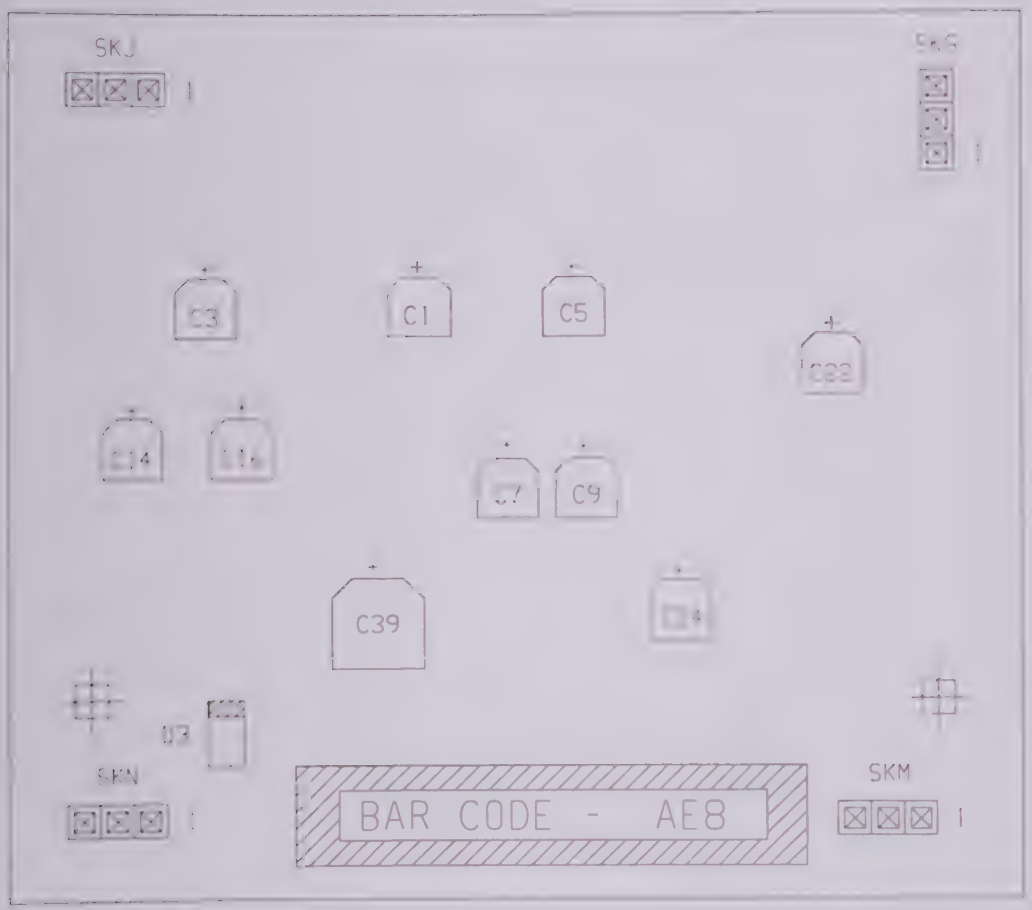


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Fig. 7-141 AE8 SSB BFO - component layout

SSB BFO **AE8**

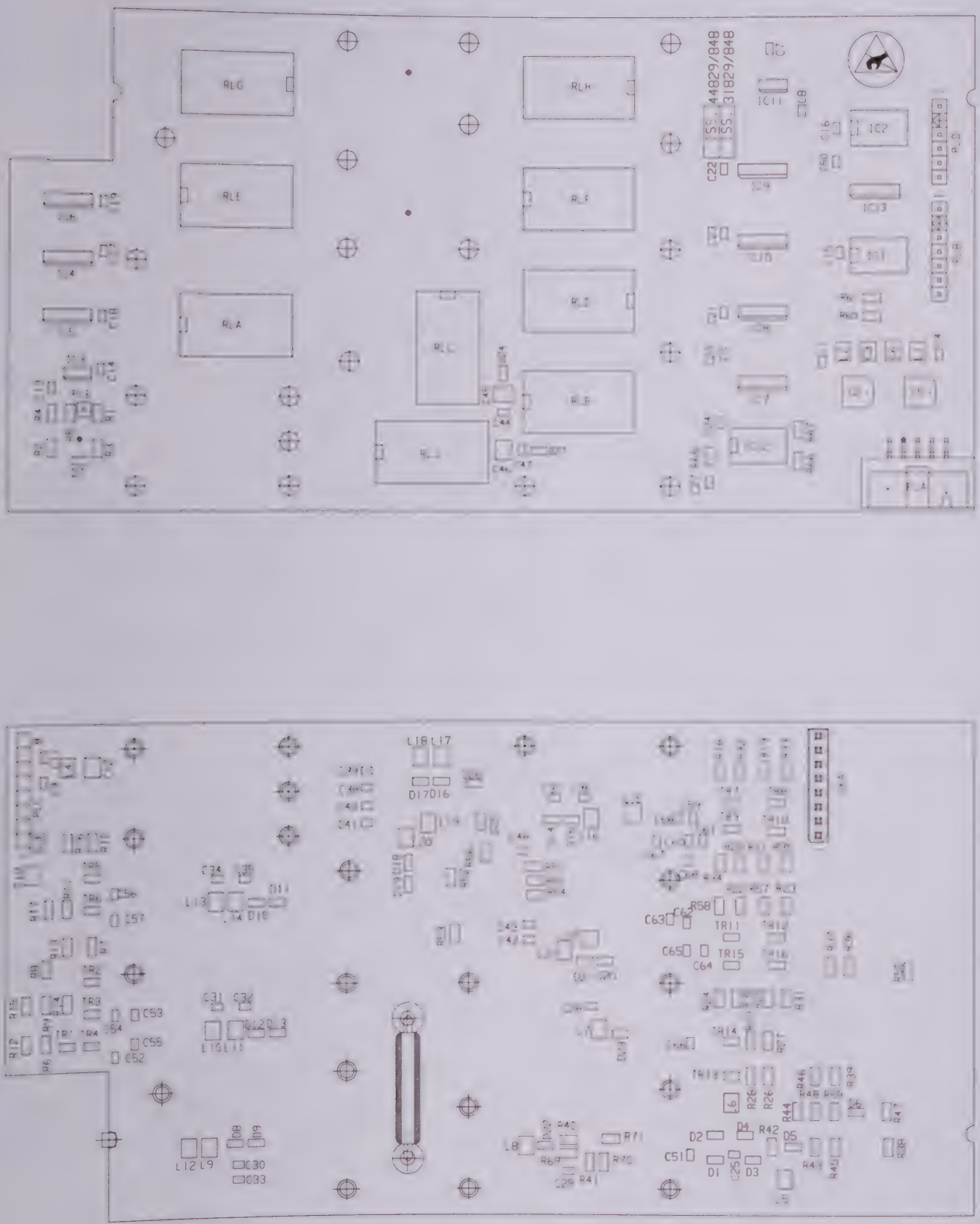

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Fig. 7-143 AA1 Input switch - component layout

Relay drivers 2, RF path switching **AA1**

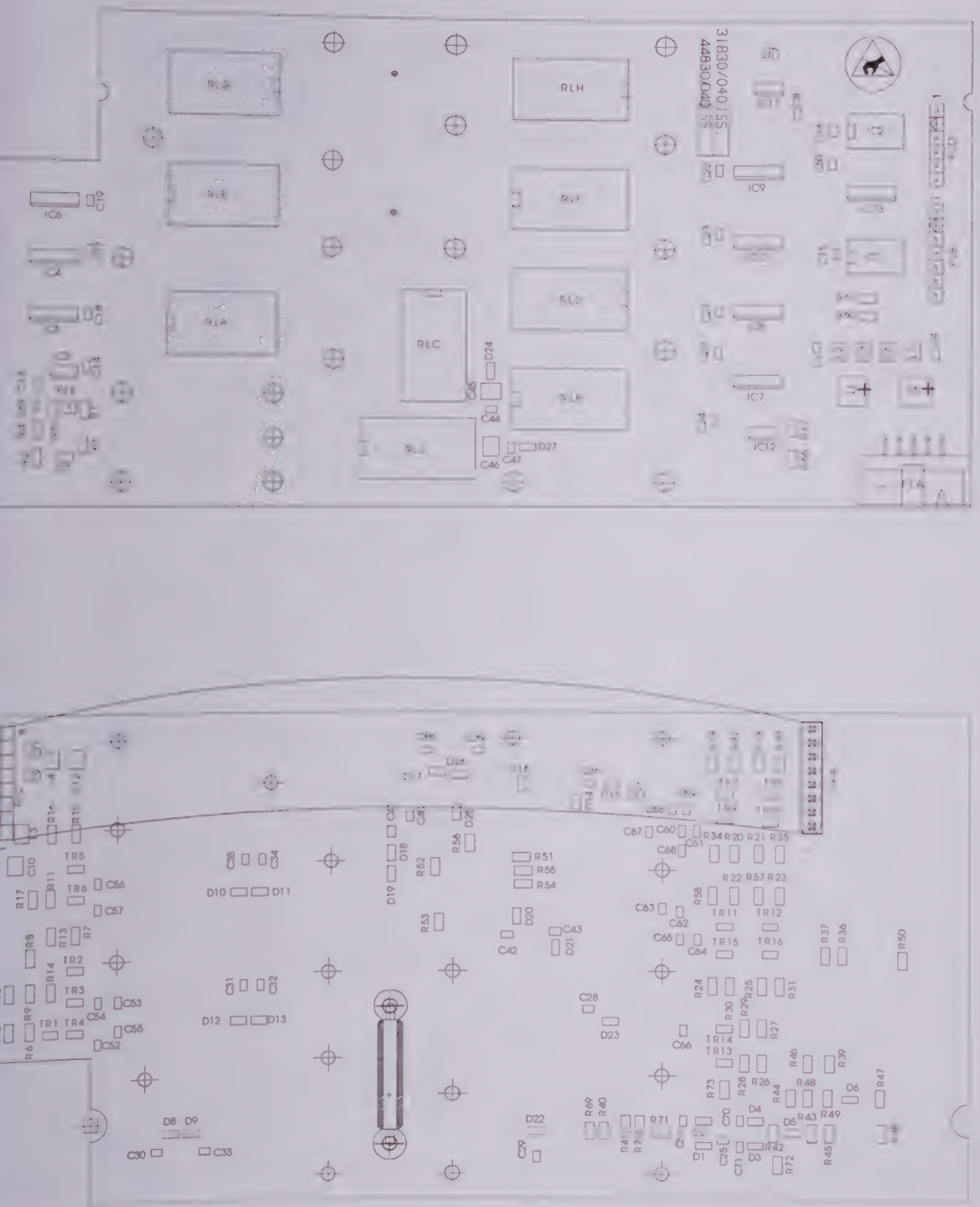

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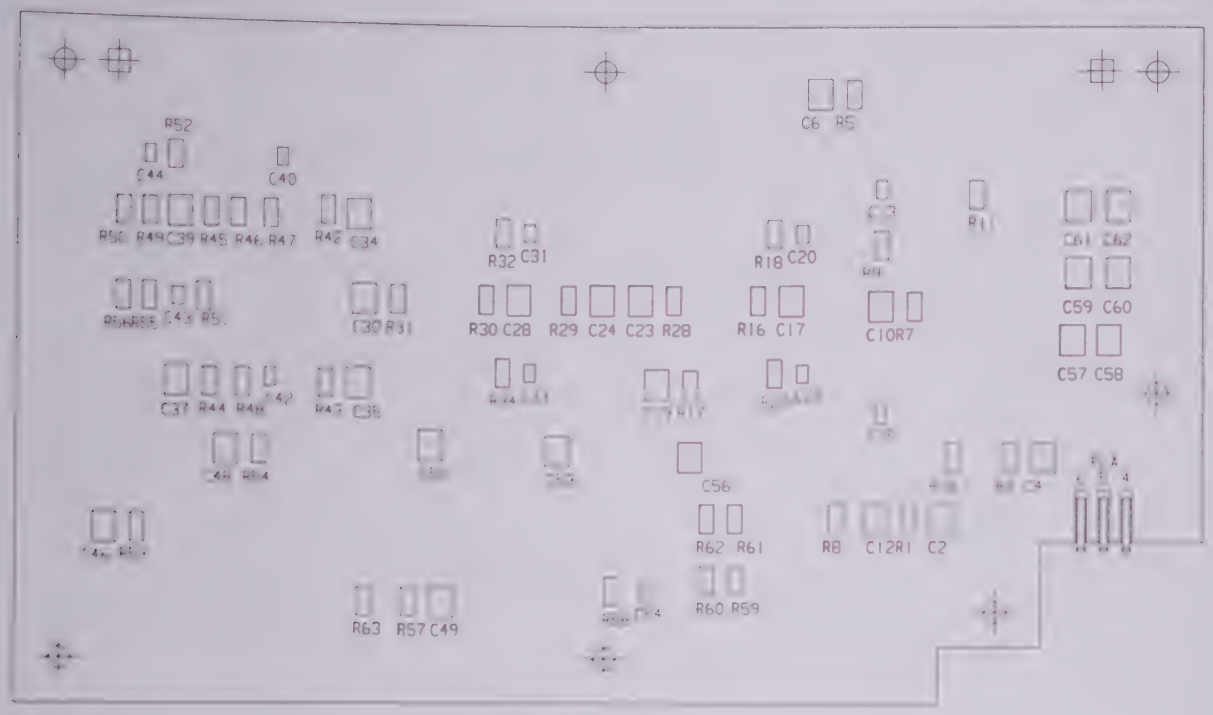
Fig. 7-146 AA1/1 Input switch - component layout

I²C control, overload detection, relay drivers 1 **AA1/1**

Relay drivers 2, RF path switching **AA1/1**



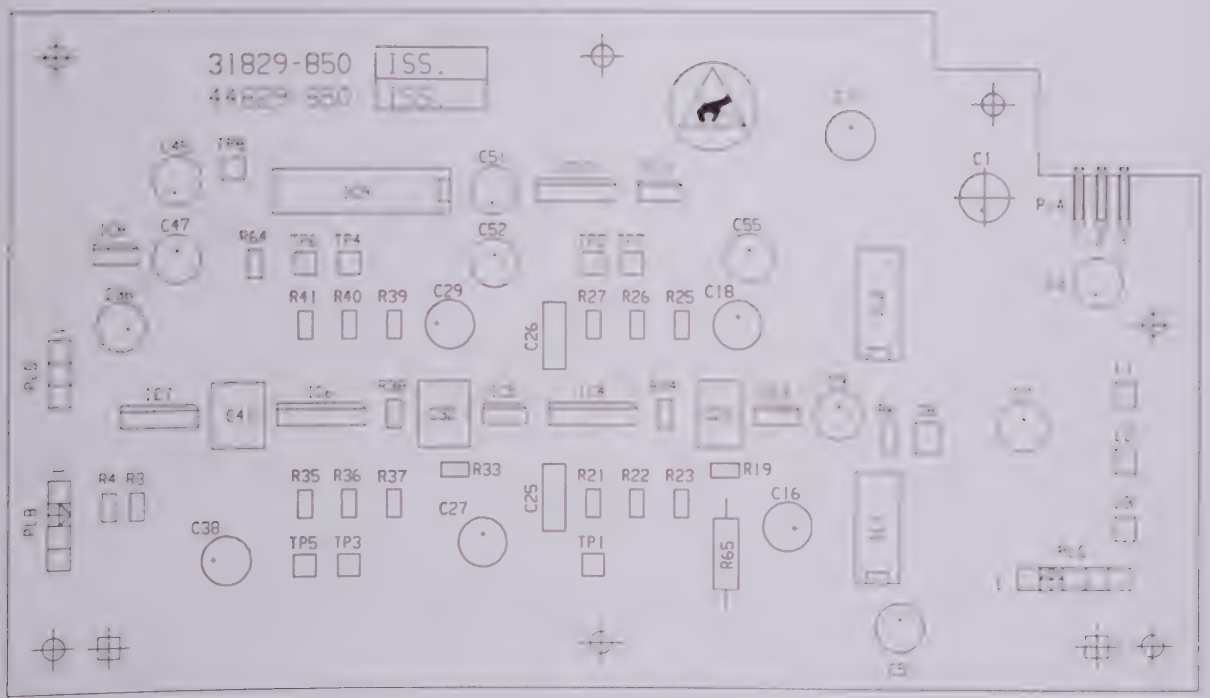


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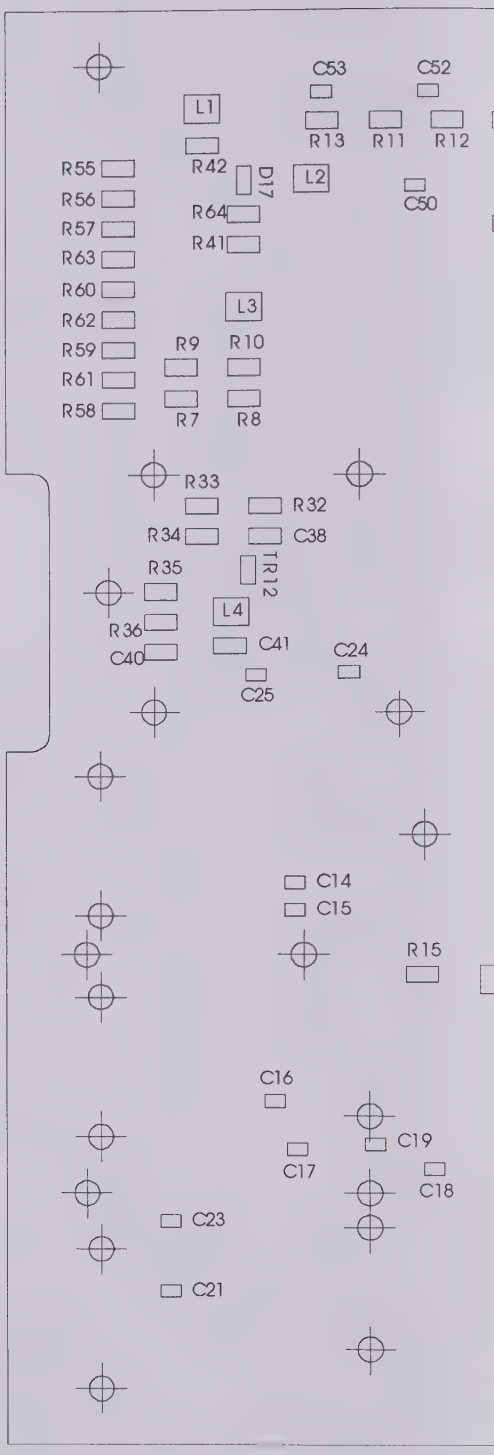
Fig. 7-149 AB2 Power meter - component layout



Power meter AB2

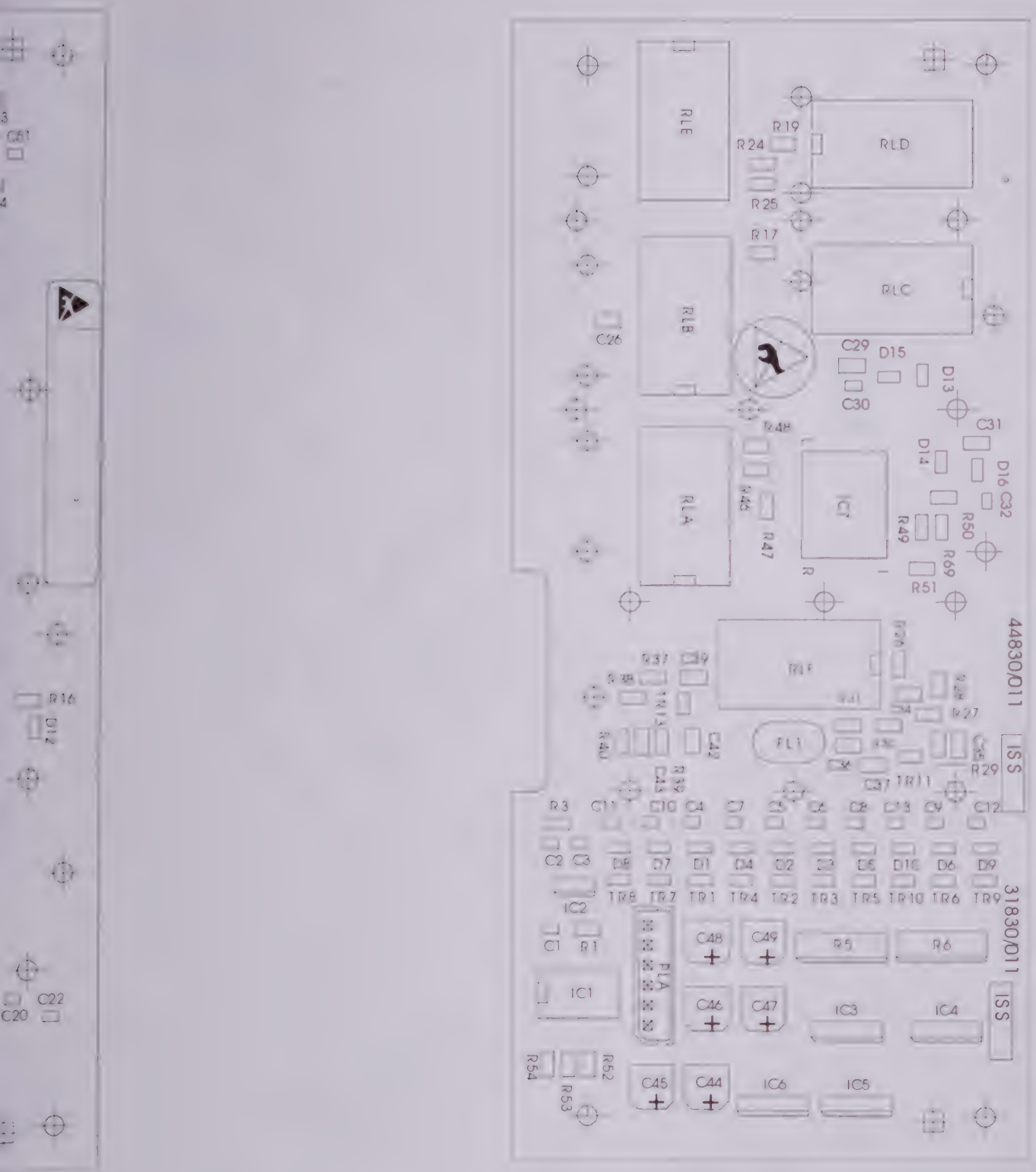


Fig. 7-151 AB3 Mixer module - component layout

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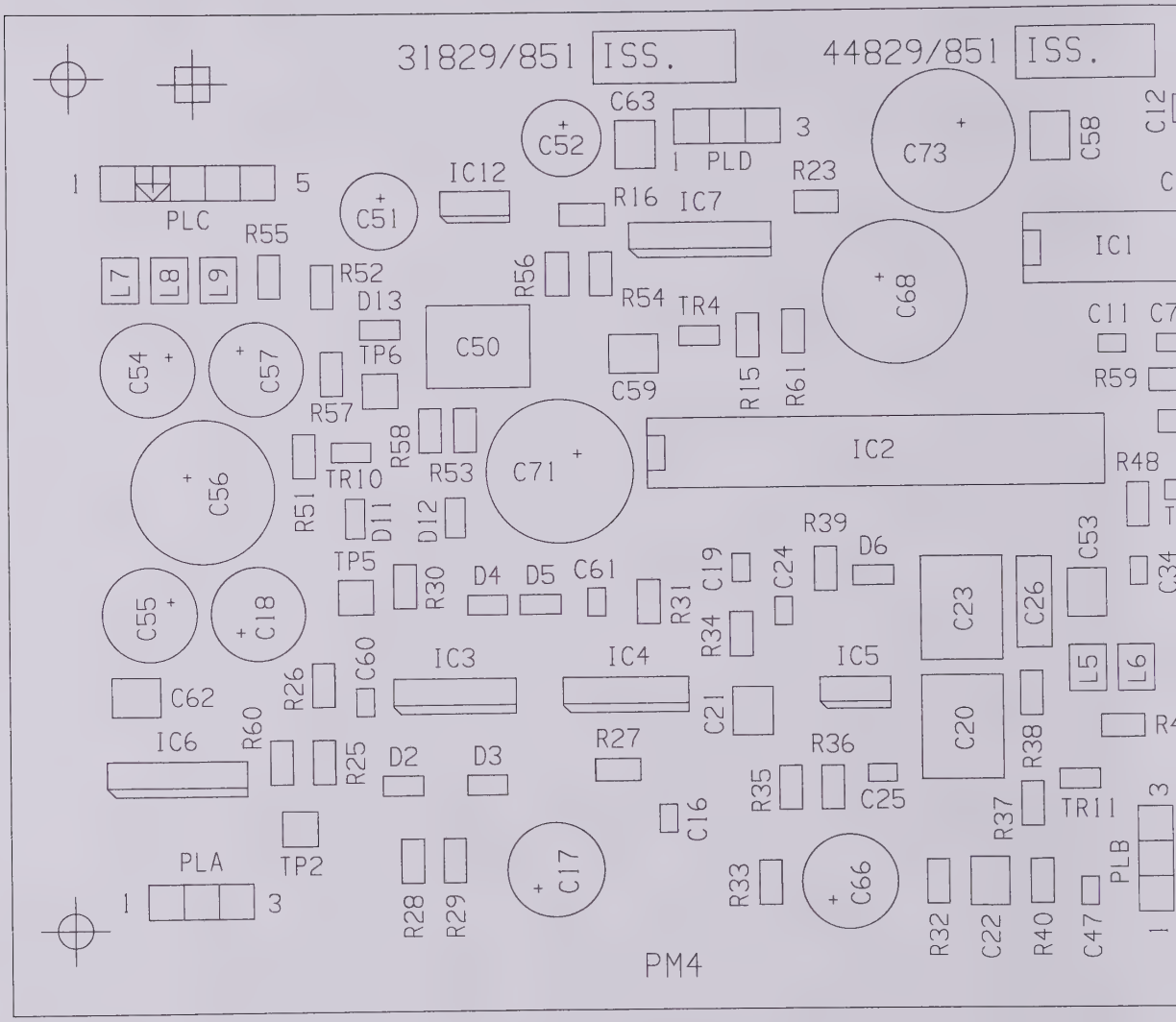
31829/851 ISS.
44829/851 ISS.
PLC
PLD
PLA
PLB
PM4
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC12
C50
C51
C52
C53
C54
C55
C56
C57
C58
C59
C60
C61
C62
C63
C66
C68
C71
C73
C17
C18
C20
C21
C22
C23
C25
C26
C47
R15
R16
R23
R25
R26
R27
R28
R29
R30
R31
R32
R33
R34
R35
R36
R37
R38
R39
R40
R48
R51
R52
R53
R54
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R56
R57
R58
R59
R60
R61
TR4
TR10
TR11
TP2
TP5
TP6
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D3
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L7
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L9

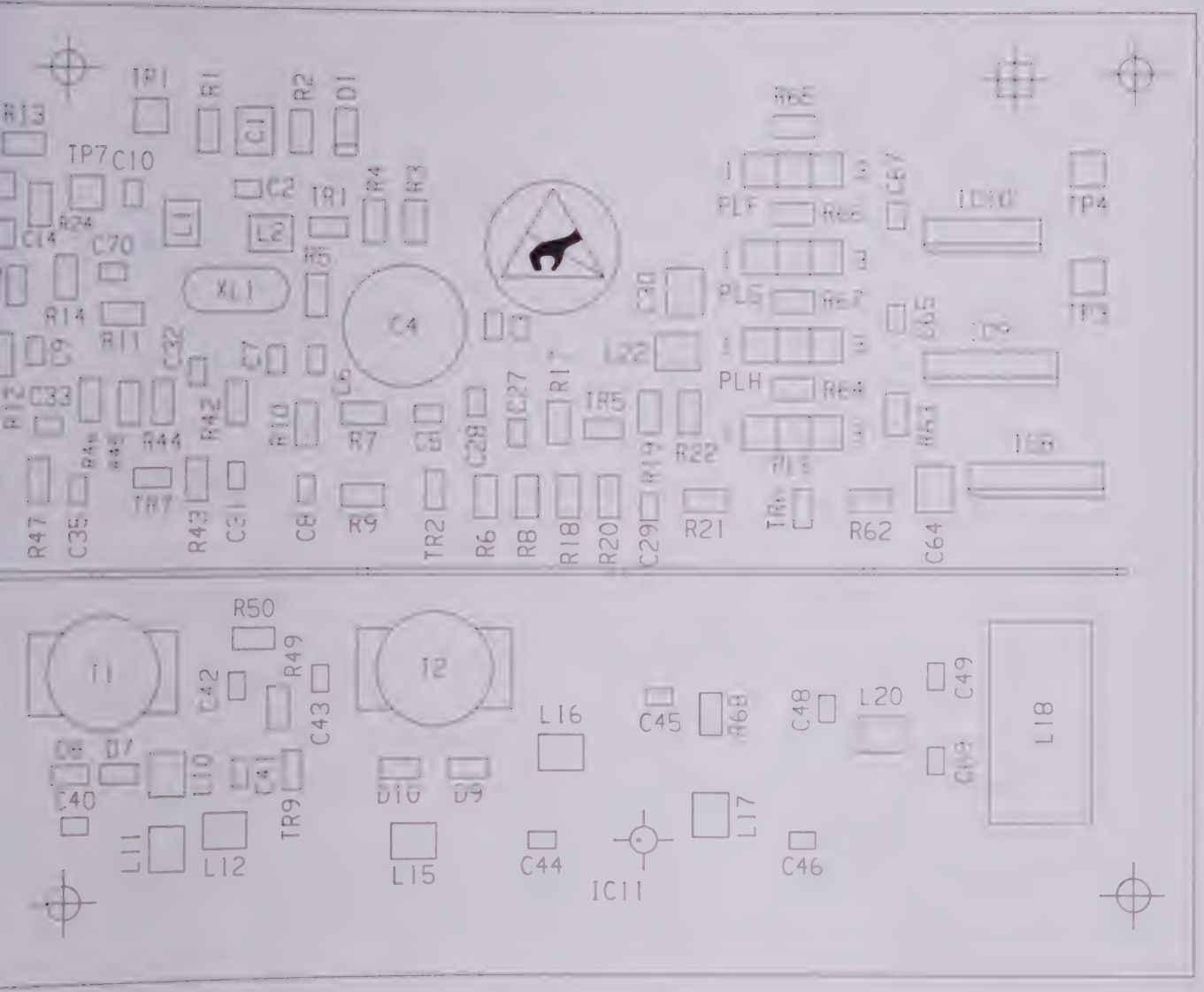

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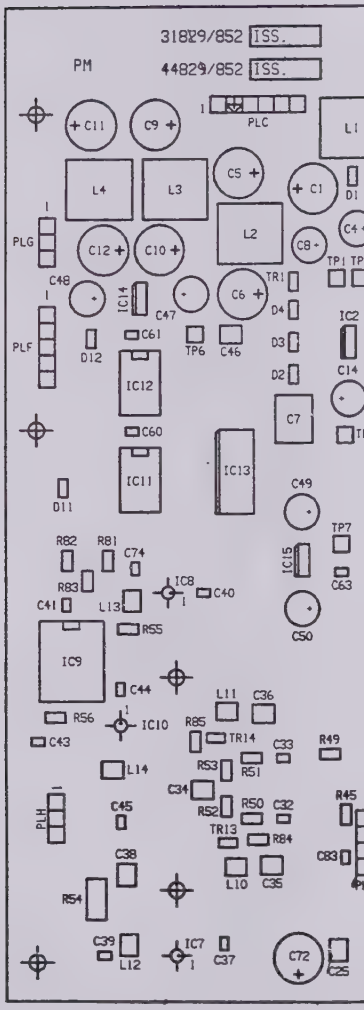
Fig. 7-153 AF1 VCXO and PLL - component layout



VCXO and PLL AF1

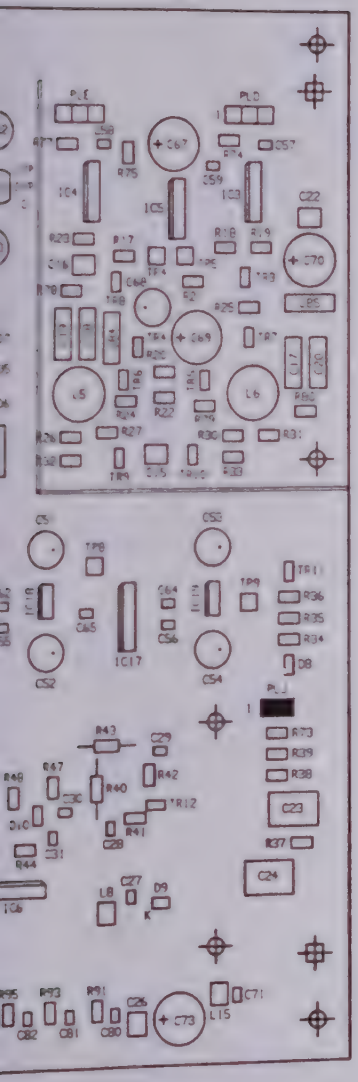


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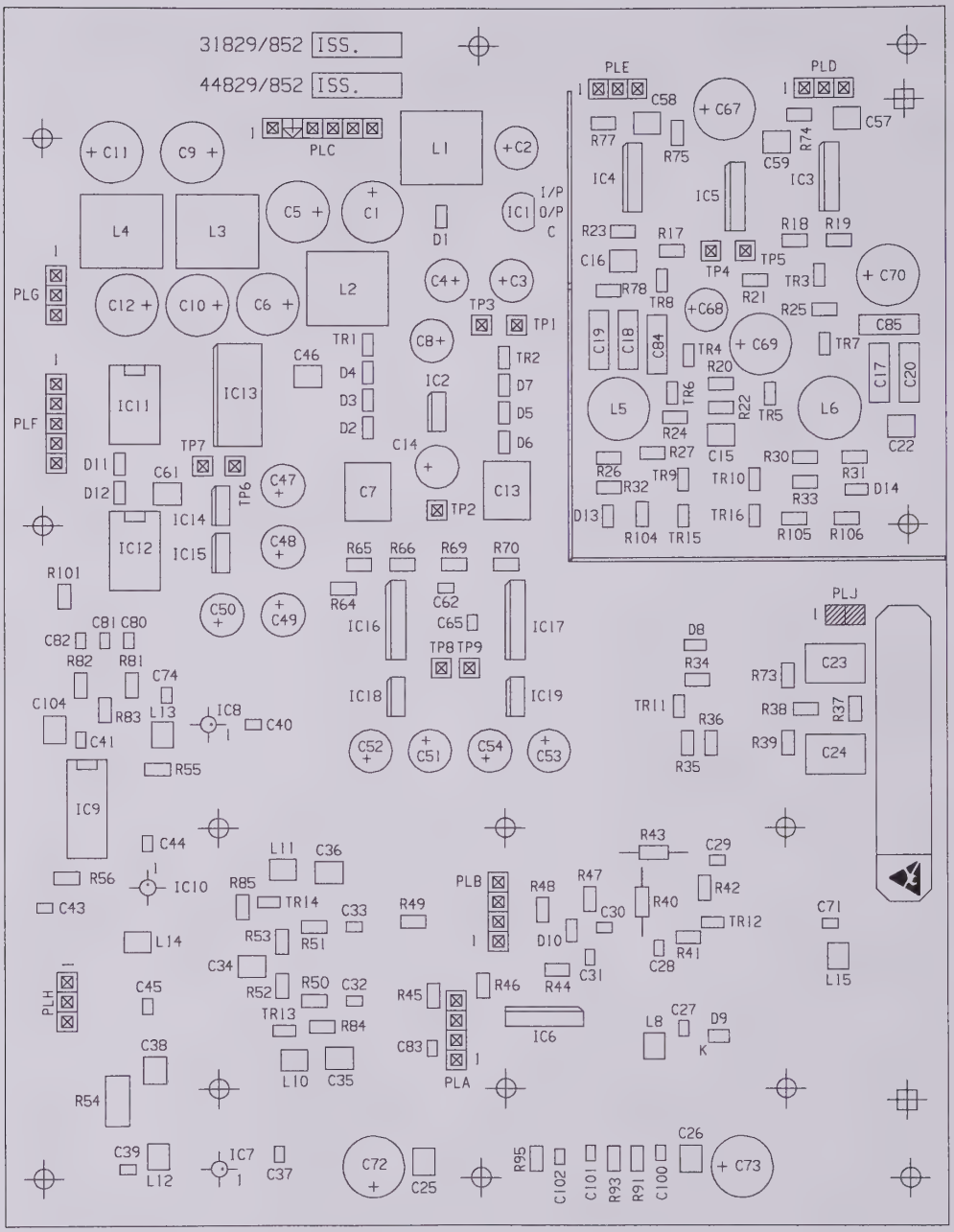
Fig. 7-155 AF2 RF oscillator (earlier version) - component layout



RF oscillator (earlier version) AF2

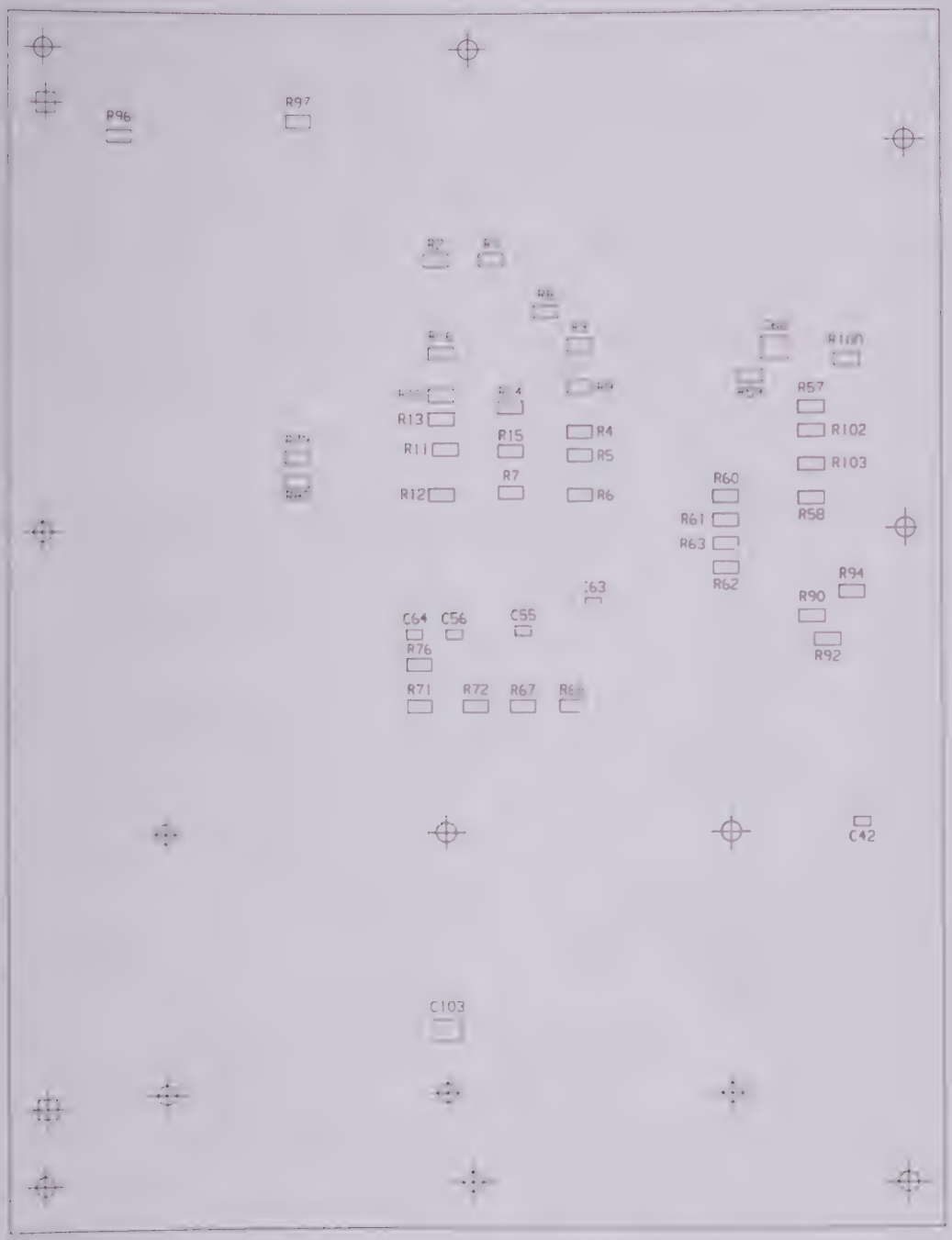


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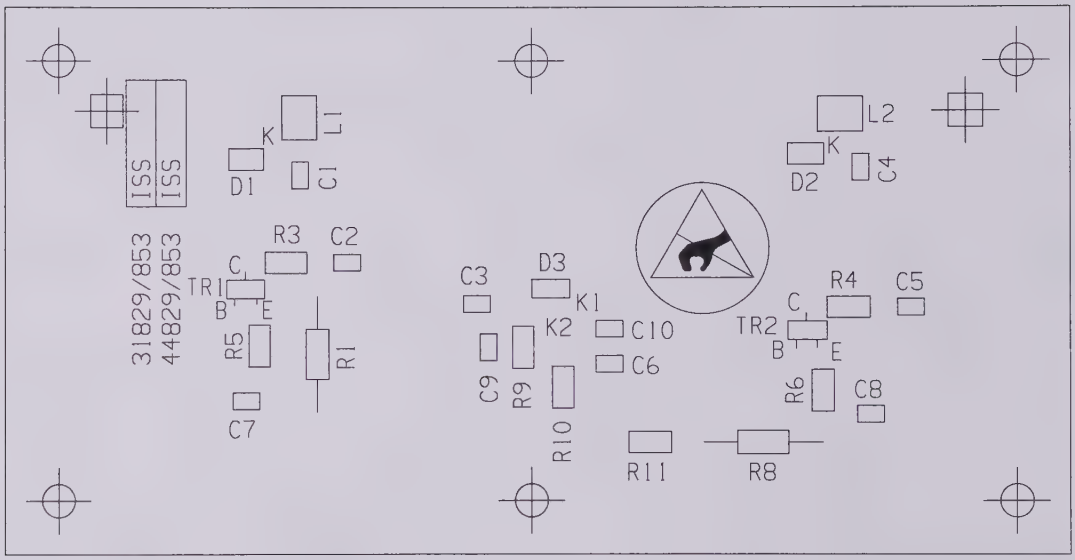
Fig. 7-157 AF2 RF oscillator (later version) - component layout



RF oscillator (later version) AF2

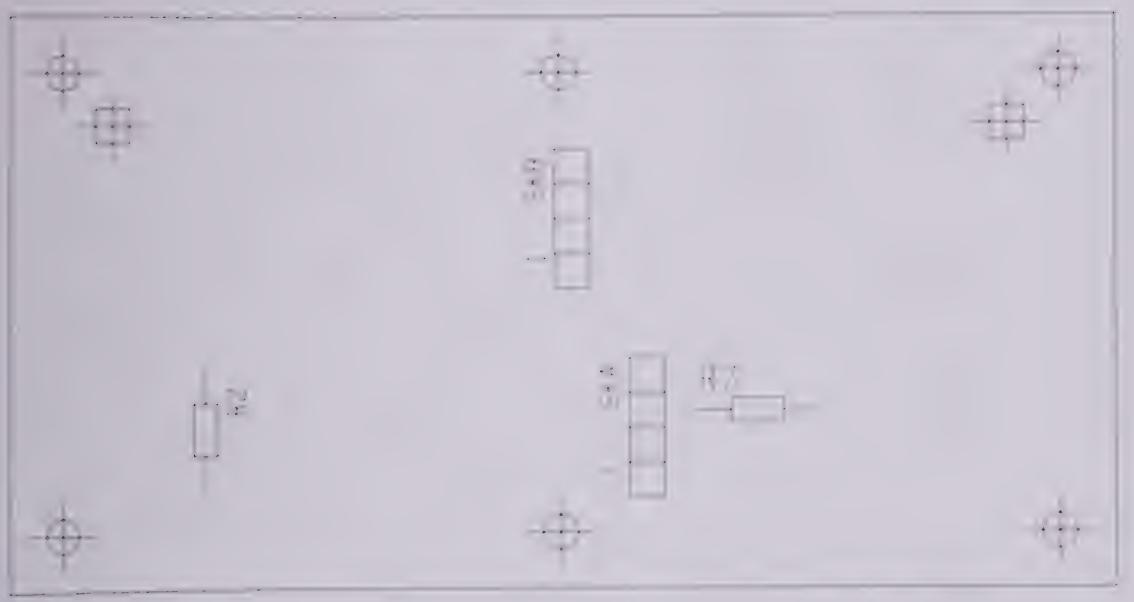


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Fig. 7-159 AF3 VCO - component layout

VCO **AF3**

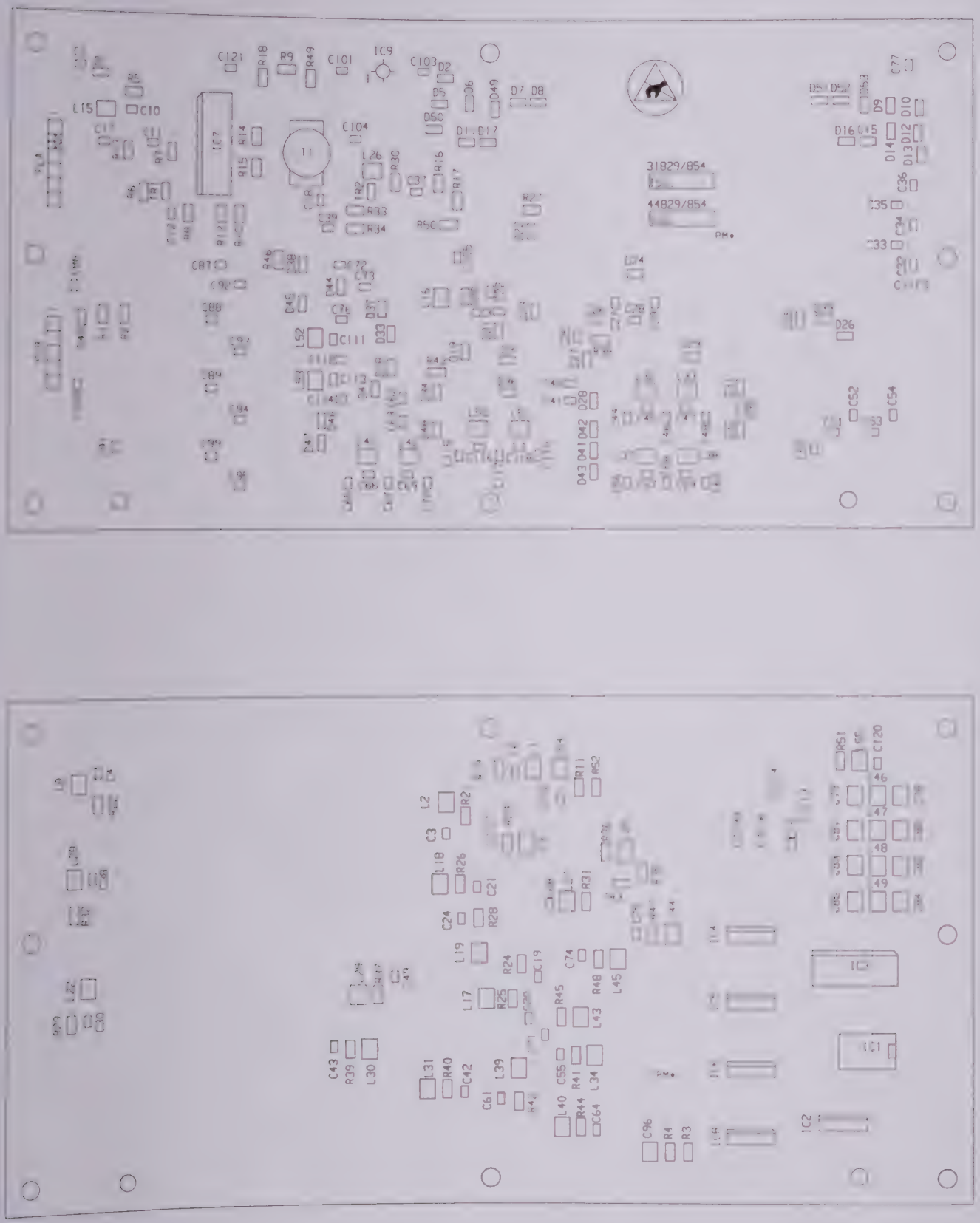

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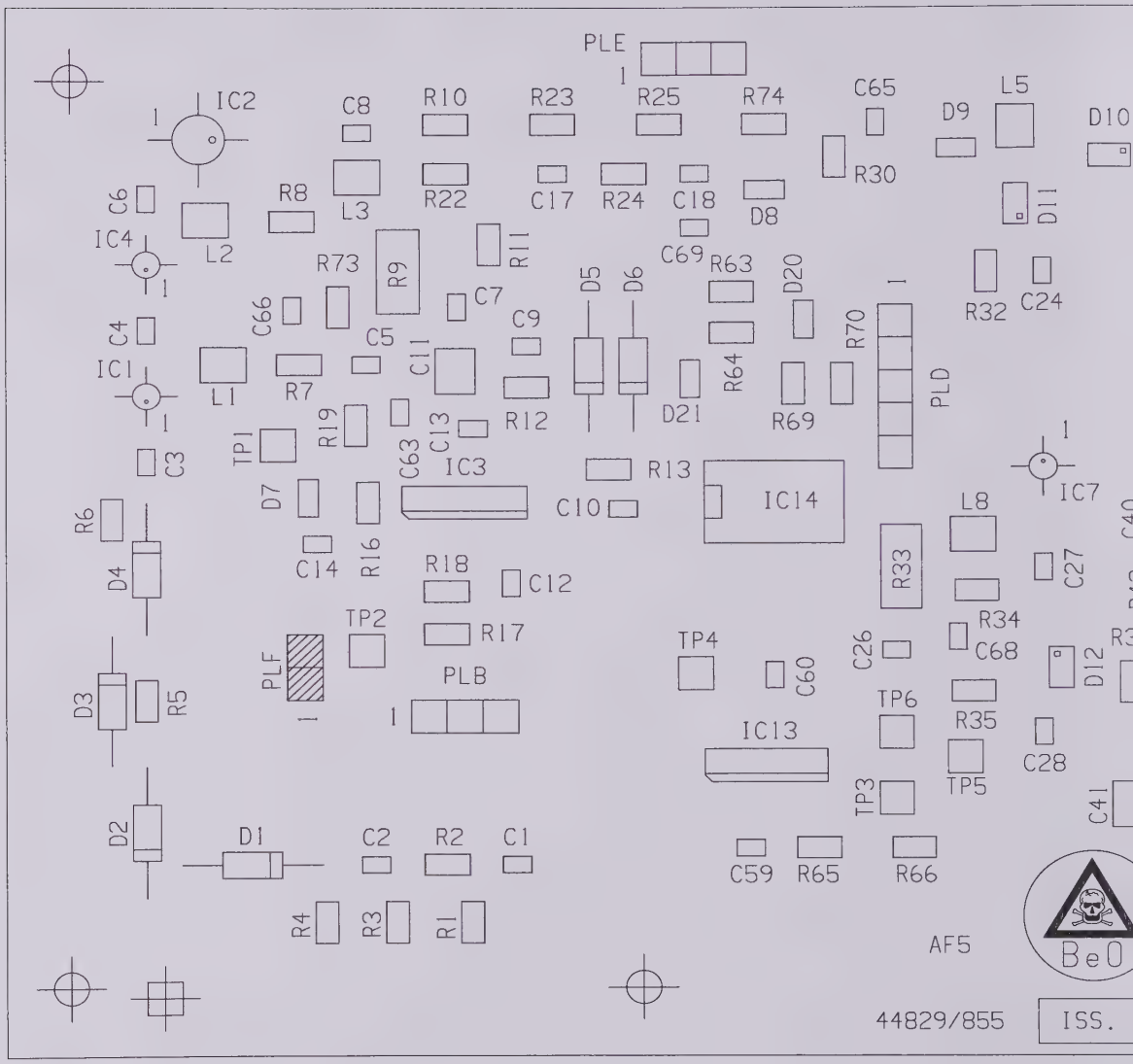
Fig. 7-161 AF4 RF divider - component layout



RF divider **AF4**

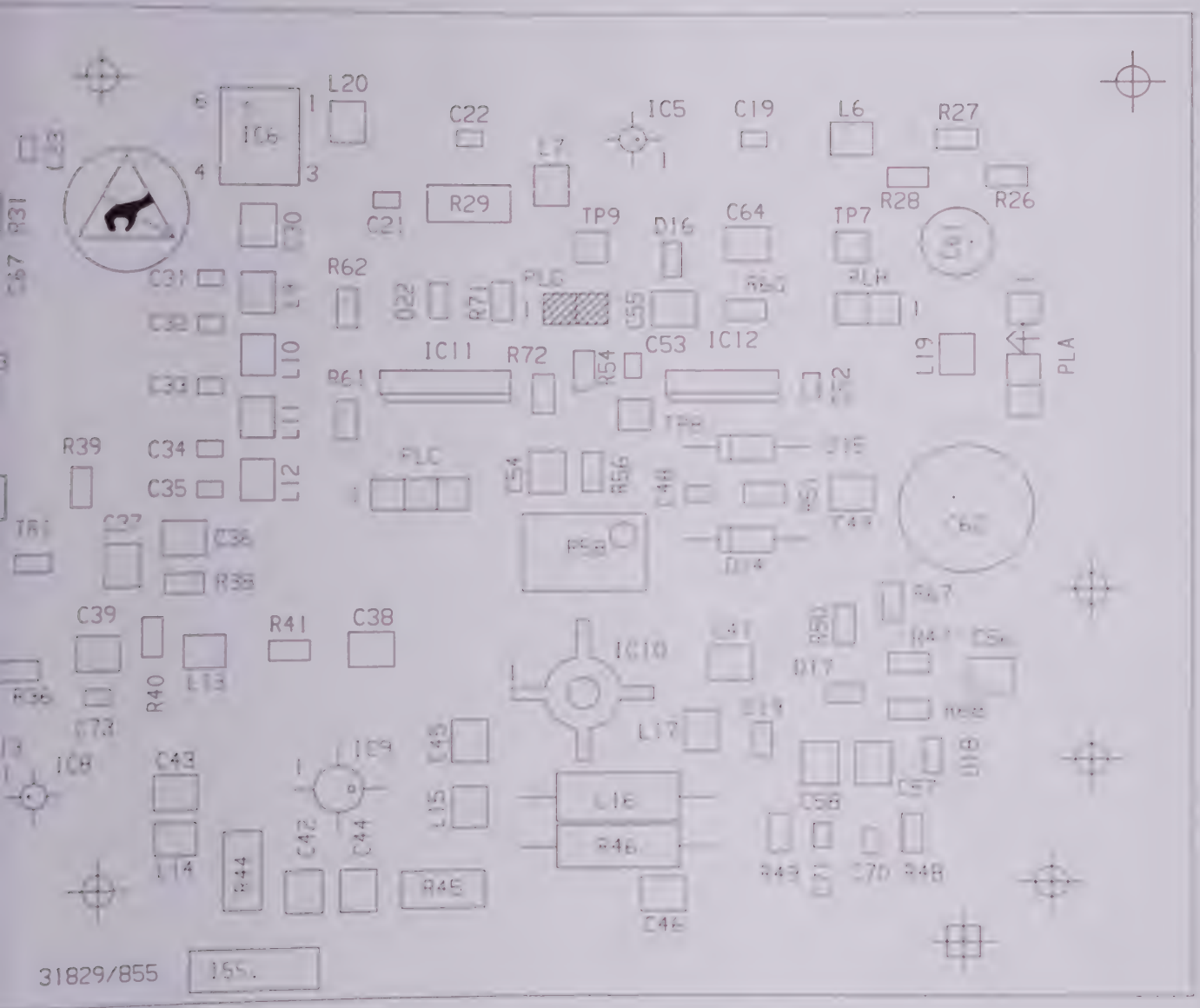


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Fig. 7-163 AF5 RF output - component layout

RF output **AF5**

Power supply module (AC-DC)

Power supply module (DC-DC)

Power supply module (control 1)

Power supply module (control 2)

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